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When you finish reading this magazine place a 1-cent stamp on this notice, mail the magazine, and it will be placed in the hands of our soldiers or sailors destined to proceed over-seas.
NO WRAPPER—NO ADDRESS.
A. S. BURLESON,
Postmaster General.

TELEPHONE ENGINEER

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"Two thousand dollars' worth of Automatic Equipment displaced a $20 a month operator in 1905. This same $2,000 worth of equipment is still displacing one operator, but her salary today would be $40 per month."

This, in substance, is the statement of an official of a large telephone company which has been operating Automatic equipment for the past 13 years, and summarizes one of the advantages secured by his company's action in those earlier days.

It was profitable to adopt the Automatic when operators were paid $20 per month. It was advisable when operators were plentiful. It was advantageous to company and users alike, when the demands on the service were much simpler than now.

Today the profit is greater and the necessity more pressing than ever before.

The features of Automatic service have not changed but present conditions make its merits constantly more important and essential.

Automatic Electric Company
CHICAGO

Manufacturers of Automatic Telephone Equipment to meet the most exacting requirements of local, rural, long distance and private exchange.

Short of Men?

OSHKOSH TOOLS

The Oshkosh Line Includes:
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Then by all means equip your men with good tools. It's the only way to overcome the shortage of labor. Select a special tool for every purpose. Let each gang have a complete set, then every gang you have will do more work and do it with pleasure—without added energy.

You need Oshkosh Tools. They are designed to do better work and are guaranteed. A tool for every purpose. That's why big users prefer them. Get them from your jobber now—you'll find it pays.

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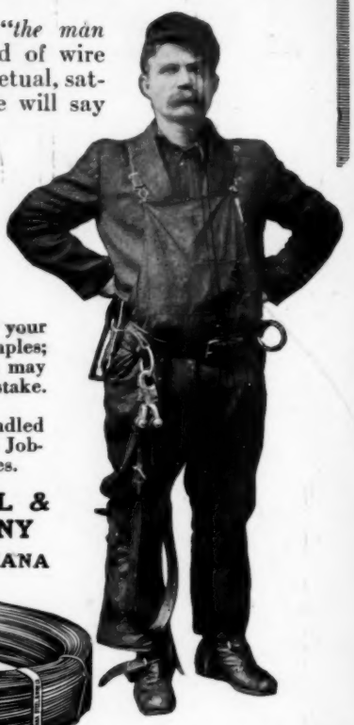
Ask your Lineman, *"the man who knows,"* the kind of wire best adapted for perpetual, satisfactory service. He will say

Muncie Wire

if he has ever seen, tried and tested it.



Before purchasing your next supply get our samples; test and compare, we may save you a costly mistake.

Muncie Wire is handled by most representative Jobbers and Supply Houses.

INDIANA STEEL & WIRE COMPANY
MUNCIE, - INDIANA

Ask the man who knows

Telephone Wire

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F. W. SCHWAMB, Manager

PAUL H. WOODRUFF, Editor
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Telephone Engineer

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VOL. XX CHICAGO, NOVEMBER, 1918 NO. 5

Consolidating Offices and Facilities

THERE has never been a strong movement in this country for government ownership of railways. There has always been a very considerable sentiment for government ownership of wire communication lines.

The physical consolidation of railroad facilities so far extends only to the merging of ticket offices. This arrangement was not wholly unknown to private operation. It may be readily dissolved on return to that condition, or it may be continued on a co-operative basis. It does not prejudice the promise of government relinquishment after the war.

The consolidation of Western Union Telegraph, Postal Telegraph-Cable, and United States Post Office under a single roof is going on quietly but effectively in various communities. This, apparently, is a merger not merely of facilities, but of overhead charges and of revenues. The wire companies are to be co-tenants with the Post Office (which pays no rent); special delivery letters and telegrams may be delivered by the same messenger, with a happy disregard for the proper division of his labor charge. It is clear enough that once these conditions are put into effect, the omelet will be well browned, and far past any possibility of unscrambling.

That the conversion of government control into government ownership will succeed is far from apparent. That it will be attempted, however, is already evident. The most optimistic of operators may as well bring their minds to the conclusion that the old question of public ownership is about to be threshed out—and with the advantage already in the hands of the opponents of private ownership.

It has been said that this country is as ill prepared for peace as it was for war. If that be a spur to still greater business industry and diligence, it does not exempt the telephone man. His preparation for peace will be measured by the determination with which he faces the problems of converting government control back to private control. We hope those problems will be purely technical and not political.

Standardized Service

IT IS an amiable fault of commission control that it takes little count of quality. If a telephone company serves so many subscribers at so much expense, its rates should be high enough to cover the expense plus a reasonable profit. The fact that one manager may keep the expense lower than another, or may deliver better service with the same expense, or may so maintain his plant that it becomes a greater public asset, does not ordinarily enter into the calculation.

On another page Mr. H. N. Faris discusses standard service versus standard rates. He demonstrates that the term "standard rates" would be a mockery where service might vary in excellence from zero to a hypothetical hundred per cent. His object, of course, is not to dwell upon this rather obvious point, but to suggest a practical method of classifying such service with the simplicity and certainty of a teacher marking a pupil's report card.

Mr. Faris deals with magneto systems because magneto systems have no standards; their performances show the maximum of variation and the minimum of exact practice. "Standard" rates under such conditions are open to the same criticism as standard wages in labor organizations whose members range all the way from incompetent to expert.

If slipshod and negligent maintenance is just as profitable, and much easier, it has the advantage. That is contrary to all the rules of efficiency, but it is dangerously applicable to the condition of standardized rates and unstandardized service. It is the unfortunate human tendency, in merchandising anything from service to soap, to deliver the least that will satisfy the customer.

The possible grades of service, from poor to excellent, are more numerous than the grades of excellence of any commodity. To recognize and tabulate these grades on a fixed arithmetical basis opens the door to direct standardization of service, which must, as Mr. Faris says, precede any attempt to standardize rates.

Another Decision for Competition

HOLDING that a telephone service is simply an extension of the telegraph service, the Illinois supreme court has handed down an opinion to the effect that telegraph companies doing business in Illinois did not have to obtain a certificate of convenience and necessity from the Illinois Public Utilities Commission to do a telephone business.

In rendering this decision the supreme court overrules the judgment of the Sangamon county circuit court, which had sustained the Illinois Public Utilities commission in its order requiring the Postal Telegraph & Cable Company to obtain a certificate of convenience and necessity from the commission before it could do a telephone business. The complaint to the Utilities commission was made by the Chicago Telephone Company, which alleged that the Postal company is doing a telephone business between Chicago and Joliet and other down-state cities and infringing on its Chicago company's rights.

The opinion that telephone service is simply an extension of the telegraph may be superficially amusing or displeasing to the telephone consciousness. But, in the light that it recognizes the rights of competitive operating, it deals another blow to the theory that the telephone is a natural monopoly.

The Illinois supreme court has added one more to the growing list of decisions supporting the principle of competition in the telephone business.

Hundred French-Speaking Operators Wanted—Rush!

THAT the success of General Pershing's heavy blows against the Hun line has been materially aided by the almost superhuman resourcefulness of men in the United States Signal Corps, is the story brought back from France by every returning officer.

The telephone branch of the Signal Service has covered itself with glory, time and again. The "Stars and Stripes" in a recent issue featured a front-page story whose headlines give some idea of the stirring account that followed:

EVERYBODY SAFE? NO, NOT EXACTLY, BUT HOLDING ON

Soldiers of the Telephone Precede Infantry in Hill 230 Attack

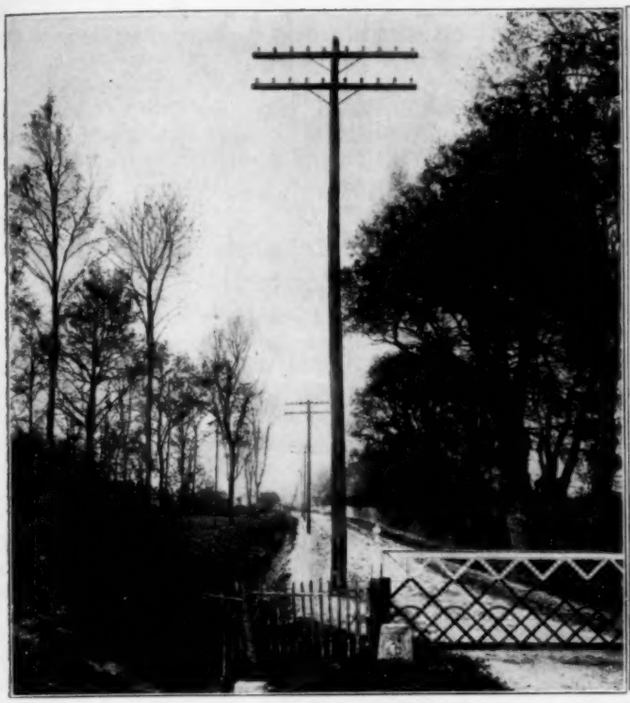
WIRES ALONE KEEP PACE

"Brigade Terrible" Runs Ahead of Guns and Supplies, but Can't Lose Signal Corps

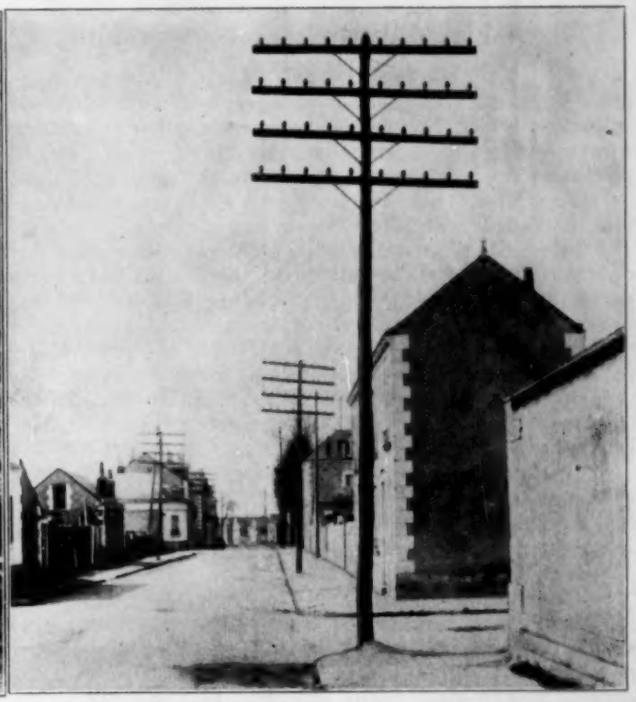
It is not only in the battle areas that the telephone units of the Signal Corps are giving distinguished service, for a vast network of American telephone lines link every outpost to every center of the vast United States military and naval organization in Europe.

At the present time the Signal Corps needs 100 additional men who speak French fluently for service as switchboard operators. French-speaking men without previous experience in telephony will be accepted, trained in this country, and sent to France without delay. This is an unusual opportunity for men eager to be in at the finish of Kaiserdom, giving, as it does, a chance to join a highly specialized arm of the service and to "go over" without months of training and waiting on this side.

Applications should be sent at once, by telegram or letter, to the Chief Signal Officer, Washington, D. C. They should state the applicant's name, age, qualification—ability to converse in French is paramount—together with his present status in the draft and the name and address of his draft board.



At a Railway Crossing Gate in France, American Wires Are Raised.



American Telephone Lead Crossing Street of French Village.

Work of Telephone and Telegraph Men of the U. S. Signal Corps in France.

This is the War Department's own telephone and telegraph building recently completed at 1723 F Street, N. W., Washington. It is a three-story and basement building, fronting 44 feet on F street and running 114 feet deep. The construction is such that a fourth story and elevators may be added when necessary. It is of brick construction, the front and side returns of face brick with limestone cornice and belt courses.

Each floor of the building contains a net area of about 5,000 square feet and from top to bottom the construction is of the most fireproof type. The floors are reinforced concrete slabs.

The third floor consists of a single large room containing the War Department's telephone switchboard. One long line of switchboard — 15 sections, or 45 positions —running nearly the full length of the room on the east side, is installed and 10 additional sections are to be installed in a separate line.

On the second floor suitable provision has been made for the comfort of the telephone operators. Space is also available on the second floor for additional telephone equipment if it should prove to be needed.

In the rear of the first floor is located the terminal room. Next to the terminal room is the telegraph office of the War Department, and in the extreme front is located the office of the War Department's director of telephones.

The basement contains the heating plant, fuel storage space, the vault through which the underground cables enter the building from the street, and a part of the power plant.

The telephone switchboard is of the type now used in the large central offices. The initial equipment contains 45 operators' positions, and will accommodate 5,000 lines. There is a chief operator's desk and a complete information bureau. The switchboard is planned to be increased, if required, to 8,000 lines, its normal capacity, and if it should become necessary, may be even further extended so as to contain 100 operators' positions and accommodate more than 10,000 lines. There is a wire chief's office equipped with all necessary testing apparatus, similar to that installed in cities of forty or fifty thousand.

One hundred telephone experts worked day and night for two months to install the equipment.

STORIES IN PICTURES OF TELEPHONE PRACTICE AND PROGRESS IN ALL PARTS OF THE WORLD

Influenza

All over the country telephone operating companies are in difficulties because of the epidemic of influenza which has seriously reduced their operating forces while incidentally increasing the use of the telephone as a substitute for personal communication.

The New York Public Service Commission, second district, learned from reports of its own inspectors and from other sources that in many communities the operating forces of the telephone companies have been seriously depleted by the prevailing epidemic of influenza. This results in a very serious impairment of telephone service and at the same time the prevalence of illness creates a greater demand for the service. In one of the smaller cities, out of a regular force of 30 operators there were only three regular operators on duty.

The commission has, therefore, urgently appealed to the public communities where the epidemic prevails and in those where it may hereafter appear to use the telephone as little as possible and for only necessary purposes as long as the epidemic shall prevail.

The Chesapeake and Potomac Telephone Company in Washington announced that unless the public observed strictly its printed request to eliminate every non-essential call it would be compelled to restrict its service to the vital needs of the nation and the community.

Added to the great increase of calls between doctors, nurses, patients, hospitals and druggists, the company had its regular rush of government and wartime business to handle.

With one-third of the 3,000 operators of the Bell Telephone Company in Philadelphia ill with influenza, and the service badly crippled, another appeal urging co-operation of telephone users was issued by the company. Approximately 1,800 employes of all kinds out of an entire force of 6,000 employed by the Bell were ill.

Eighty per cent of the public telephone pay stations of the Bell Telephone Company have been closed throughout the city.

The local newspaper press was used generally by companies to inform their patrons of conditions and to urge patience and co-operation. Other companies sent out notices to subscribers. Hardly a state escaped the enforced restriction of service, which still persists in many communities.

Trench Telephone Electricians Wanted

The Pennsylvania State College has been asked by the War Department to train a class of 165 trench telephone electricians. Instruction will be given the soldiers by experts in the School of Engineering. The class began work October 21.

Applications for admission to the class will be received by Dr. Edwin E. Sparks, the college president. Candidates must be nineteen years old, or more; they must have completed at least two years in a high school; and they must have had practical experience in wiring houses for electric light, in installing or maintaining city electric lights, in erecting or mantaining telephone or telegraph lines, or have worked in a power house.

They must also be qualified registrants of September 12, who are physically qualified for general military service. Those able to meet the requirements should address the president's office, at State College, for form No. 2008A, which will admit them to the electricians class of the Pennsylvania State College.

Those who desire to enter the motor truck driving or repairing, smithing, or trench telephone classes, should apply to their local draft boards for indication on the form indicated.

Electrical and Mechanical Engineers Wanted

The West Chicago Park Commissioners are contemplating a combination of their present Electrical Division and Steam Heating Division into a Mechanical and Electrical Division. If this change is made a mechanical and electrical engineer will be placed at the head of the new division. This announcement is being made in order to get in touch with persons interested in this new position, which will pay about $3,300 per year at the start and $3,600 per year as soon as the incumbent has fully demonstrated his ability to satisfactorily handle the work. The mechanical and electrical engineer will also be allowed the use of an automobile while on duty.

The entire service of the Park Commissioners is operating under a stringent civil service law which insures permanent tenure to all efficient and competent employes. The final appointment to this new position will be given to the person who receives the highest average in a civil service examination open to men residing anywhere in the United States.

All persons interested in a position of this character are urged to communicate with Mr. A. C. Schrader, superintendent and chief engineer, West Chicago Park Commissioners, Union Park, Chicago.

Telephone and Radio Men Wanted

Three hundred telephone and radio electricians are wanted by the War Department Committee on Education and Special Training for assignment to schools at Salt Lake City and Logan, Utah, and the University of California at Berkeley, according to announcement made by James E. Addicott, district educational director. Men in the western district wishing to enter one of these schools should immediately send name, address and qualifications, including draft status, to the Military Bureau, room 114, University Hall, University of California.

If the qualifications sent to this bureau are satisfactory, the men will be advised to make direct application to the committee in Washington, by which they will be inducted into these schools. The school at Berkeley offers radio electricity, the ones in Utah telephone electricity. They opened October 15.

Between 300 and 400 men will be wanted for induction into the schools on the 15th of each month until April, 1919, Dr. Addicott announces. Men interested in any vocational section courses should make their wishes known to their draft boards on their questionnaires.

The Crawford County (Ohio) Court of Appeals having held unconstitutional the law forbidding telephone companies to enter into territory where patrons are now being served, error was prosecuted to the Supreme Court by the local telephone company of Crawford County.

Official Orders and Semi-Official Comment

Bell Compensation Worked Out; Independent Association Further Explains Order 1931

Executive Order

Censorship of Submarine Cables, Telegraph and Telephone Lines.

THE Executive Order of April 28, 1917, No. 2604, relating to the censorship of submarine cables, telegraph and telephone lines, is hereby amended to read as follows:

Whereas, the existence of a state of war between the United States and the Imperial German Government makes it essential to the public safety that no communication of a character which would aid the enemy or its allies shall be had.

Therefore, by virtue of the power vested in me under the Constitution and by the Joint Resolution passed by Congress on April 6, 1917, declaring the existence of a state of war, it is ordered that all companies or other persons, owning, controlling or operating telegraph and telephone lines or submarine cables, are hereby prohibited from transmitting messages to points without the United States or to points on or near the Mexican border through which messages may be despatched for the purpose of evading the censorship herein provided, and from delivering messages received from such points, except those permitted under rules and regulations to be established by the Secretary of War for telegraph and telephone lines, and by the Secretary of the Navy for submarine cables.

To these Departments, respectively, is delegated the duty of preparing and enforcing rules and regulations under this order to accomplish the purpose mentioned.

This order shall take effect from date.

September 27, 1918. WOODROW WILSON.

Telegraph and Telephone Service Bulletin No. 9

INFORMATION has reached the Department that representations are being made throughout the country that it is the desire of the Government that employees of the telegraph and telephone companies should join the Commercial Telegraphers' Union, the International Brotherhood of Electrical Workers, or other unions. These representations have no foundations in fact whatever. In its operation of the telegraph and telephone systems the Post Office Department will not distinguish between non-union and union employees. Persons will be employed solely because of their fitness for the positions to which they seek employment and must not be employed, discharged, favored, or discriminated against because they do or do not belong to any particular organization.

Officers and employees of the telegraph and telephone systems will comply strictly with the provisions of this order.

A. S. BURLESON, Postmaster General.

Order No. 2005

WILLIAM S. RYAN, Assistant Superintendent, Division of Post Office Service; John B. Colpoys, Special Agent, Department of Labor; Union N. Bethell, First Vice-President, American Telephone and Telegraph Company; F. B. MacKinnon, United States Independent Telephone Association, and Miss Julia S. O'Connor, representing the organized telephone workers of the country, are appointed a committee to investigate the working conditions of and wages paid to employees of the telegraph and telephone companies, and report as to what improvements, if any, should be made in the working conditions, the wages which should be paid the various classes of employees, and the feasibility of standardizing the same. A. S. BURLESON.

Deferred Classification for Employees

WITH reference to Bulletin No. 7, dated September 10, 1918, authorizing telegraph and telephone companies to file claims with local boards for deferred classification for employees who are absolutely indispensible to the operation of the service, telegraph and telephone companies are directed to instruct supervisory officers to incorporate in such affidavits for deferred classification Bulletin No. 7 of the Postmaster General on this subject. A. S. BURLESON.

Retention of Telephone Employees

UNDER date of October 8, the Postmaster General states that the President has called the attention of the heads of the several departments of the Government to the serious situation confronting the telephone and telegraph companies growing out of the recent heavy depletion of their trained operators due to their taking positions with other departments that they should be careful not to take operators away from the telephone and telegraph companies, which are now under government control, without consultation with the managers of the telephone and telegraph properties.

The Postmaster General requests that notice of this action of the President be given to all telephone companies and that the managers of the telephone companies are to call the President's request to the attention of any representative of any governmental agency who attempts to hire employees in the service of the telephone companies.

The Postmaster General further requests that company managers should call the attention of the employees themselves to the President's attitude in this matter, so that they may understand that the President considers their remaining with the telephone companies a duty at this time.

UNITED STATES INDEPENDENT TELEPHONE ASSOCIATION. F. B. MacKinnon, Vice-President.

Basis of Compensation for the Bell System

By Theo. N. Vail, President American Telephone and Telegraph Company.

AFTER extended conferences between the representatives of the Postmaster General and of the Bell System, covering—that there might be no misunderstanding—painstaking and exhaustive discussion and a frank exchange of views, what constitutes a just compensation for the supervision, possession, control and operation of the Bell System taken over under the proclamation of the President of the United States, has been agreed upon.

The representatives of the Bell System throughout the negotiations found nothing but helpfulness: asking no more than they thought ought to be paid by the Government, they found an intent and desire to pay all that ought to be paid, and for the protection of the property to do all that ought to be done and all that has been done in the past. In taking over the property the Postmaster General also desires to give continuity to the service, and as far as consistent with Government operation, to the personnel which has brought the property to its present degree of efficiency.

From the first exchange of views until the close, the Bell representatives were met by the Postmaster General and his representatives in a spirit of absolute fairness, and with an earnest desire to preserve the service to the public, and preserve the property for the proprietors as well as to give them established returns on their securities.

The principles adopted as a basis of compensation were:

First—Any compensation fixed for the period of control was to be considered as compensation for an emergency period and not in any way considered as establishing a value for the property.

Second—The operation of the property is to be continued on a basis of efficiency relatively equal to that of the past.

Third—The property is to be fully maintained so as to be turned back to the Company as good as when received.

Fourth—Appropriation from current revenue for depreciation and obsolescence to be the same as the past—an average of 5.72 per cent on the fixed capital—amortization of intangible capital to be relatively equal to the past. All unexpended balances from both to be invested in the plant of the system. Charges against the depreciation reserve to be in accordance with the rules of the Interstate Commerce Commission.

Fifth—Employes' pensions, disability benefits and death benefits, now in operation, to be continued.

Sixth—All taxes, municipal, state or federal, to be paid, or reimbursed if paid by the companies, by the Government.

Seventh—The license and rental contracts between the American Telephone and Telegraph Company and the license companies to be continued, and the American Telephone and Telegraph Company is to give such advice and assistance as the Postmaster General may require, is to maintain its scientific, technical and engineering departments, its patent protection for the benefit of the property in the same manner as heretofore. The Postmaster General to have the benefit during the period of control, in the operation of the wire system, of all inventions, discoveries, and ideas, which may now or hereafter be controlled by the Bell System.

These provisions are for the protection of the property, the service and the art, and provide for the continuation of the service and for the continual development of the art, as well as the protection of the developed situation, and are for the full protection of the public in its service and the proprietors in the property and development.

For the security holders is provided: (a) Payment of the interest and existing amortization charges on all outstanding securities or obligations of the Bell System in the hands of the public, including the 6 per cent convertible bonds issued August 1, 1918. (b) Payment of dividends at the existing rate upon the share capital of the Bell System outstanding in the hands of the public. (c) Payment of any charges, interest, dividends or other costs on new securities or share capital issued in discharge, conversion or renewal or extension of present obligations.

For extensions to property—. As provided, above, unexpended depreciation shall be invested in property of the System.

American Telephone and Telegraph Company surplus shall be invested in its property.

Surplus profits from operation may be invested by the Postmaster General.

If securities or capital can be issued at fair terms, the Bell System will issue its securities if desired, but the nominal value of the securities shall not exceed 80 per cent of the amount expended in the property.

Extensions to its property made with the approval of the Bell System by money furnished by the Postmaster General shall be paid for in installments of 5 per cent per annum, after the period of control ceases.

Extensions by the Postmaster General to meet abnormal conditions and made without the approval of the System shall be appraised by the Interstate Commerce Commission at the end of the period of control, and their value to the System as appraised shall be paid for in installments of 5 per cent per annum.

The whole basis of the negotiation on both sides was to ask no more than was right, to grant all that was right, and to protect a great property and a great service to the public in every possible way.

Form of Agreement Adopted as Model

The proposal of the ..... Telephone Company and its subsidiary, the ..... Telephone Company, dated ..... with respect to just compensation for the use of the properties owned by them during the period of Federal control provided for in the Joint Resolution of Congress approved July 16, 1918, and the Proclamation of the President with respect thereto, dated July 22, 1918, and the Order of the Postmaster General assuming supervision, possession, control and operation of these and other telephone and telegraph properties, dated August 1, 1918, is hereby accepted on behalf of the United States, and compensation will be paid in accordance with the terms and provisions thereof.

By direction of the President. (Signed) A. S. BURLESON, Postmaster General.

The ..... Telephone Company in behalf of itself and its subsidiary, the ..... Telephone Company, which also joins herein, both being hereafter referred to as Owner, hereby offers to accept a just compensation for the supervision, possession, control and operation of the telephone system of the Owner taken by the President of the United States under a joint resolution of the Senate and House of Representatives, dated July 16, 1918, which supervisions, possessions, control and operation commenced at twelve (12) o'clock midnight on the 31st day of July, 1918, and is referred to as Federal control, to be fixed as follows:

SECTION ONE

The Owner's telephone system, of which the President has taken such supervision, possession, control and operation, includes:

(a) All of the telephone property operated by the Owner as parts of its telephone system, whether owned or leased, and all additions, including those through consolidation and purchases made thereto during the period of Federal control, except that the Owner reserves the right to use during Federal control such portions of office buildings owned by it and now occupied in the operation of its telephone system as may be reasonably necessary to provide accommodations for its corporate organization and such use of the Federal Telephone System on such terms to the corporate officials as the Postmaster General may prescribe.

(b) All materials and supplies on hand at midnight, July 31, 1918. As soon as practicable a separate inventory of said material and supplies shall be made and authenticated for him by the signatures of such person or persons as the Postmaster General may designate for that purpose, and for the Owner by the signature of the President or a Vice-President of the Owner, which inventory, when so authenticated, shall constitute a part of this proposal.

(c) The net balance, as of midnight, July 31, 1918, in the accounts shown on the books of the Owner and under the Uniform System of Accounts for telephone companies, prescribed by the Interstate Commerce Commission as follows: (1) No. 115, Employes' Working Funds; (2) No. 118, Due from Subscribers and Agents; (3) No. 119, Accounts Receivable from System Corporation; (4) No. 120, Miscellaneous Accounts Receivable; and (5) No. 123, Other Current Assets.

(d) ..... dollars ($.....) in cash for working capital, the use of which the Postmaster General is to have during the period of Federal control without interest, which amount is the amount of working capital which the Owner has on hand August 1, 1918.

SECTION TWO

During the period of Federal control, the operation of the property of the Owner shall be continued at a standard of efficiency relatively equal to that of the past.

SECTION THREE

(a) During the period of Federal control, through current repairs and maintenance, the property of the Owner shall be maintained by the Postmaster General up to a standard relatively equal to that prior to July 31st, 1918, so that its state of repair and operating condition will be relatively the same at the expiration of the period of Federal control as its beginning.

(b) In order to make the provision for depreciation and obsolescence relatively equal to that of the past, during the period of Federal control the Postmaster General shall set aside in each year (and at the same rate for each fraction of year) (1) the sum of ..... dollars, ($.....); and (2) an amount equal to .... per cent of the cost of each addition to the property of the Owner during the period of Federal control, including additions made through consolidation and purchases, but excluding Intangible Capital, Right of Way or Land; provided, however, that for the purpose hereof said depreciation charge to be set aside as aforesaid shall be conclusively presumed to be adequate and the straight line method for computing same to be assumed; and all compensation defined and provided for hereunder is and shall be based upon the assumption that said depreciation charges are adequate. But should the United States at the close of the period of Federal control acquire the ownership of the property, it is understood that the adequacy of this depreciation charge shall be regarded as an open question.

The Postmaster General shall further make provision for the amortization of Intangible Capital, Right of Way and Land and Debt Discount, including additions to these accounts because of additions as aforesaid to the property during the period of Federal control, upon a basis substantially equal to the established practice of the Owner prior to Federal control.

The amounts so set aside shall be credited in monthly installments in accordance with the present established practice of the Owner.

The charges affecting construction, maintenance, depreciation, reserves for accrued depreciation and amortization of landed and intangible capital and for the amortization of debt discount shall, during Federal control, be made according to the system of accounts prescribed by the Commission.

The reserves for amortization of intangible capital, for right of way and land, and for the amortization of debt discount, set up as aforesaid, together with any balance remaining in the depreciation reserve (set up and created as aforesaid), shall first be expended by the Postmaster General for additions, approved by the Owner, to the property as and to the extent needed. If such expenditure does not absorb all said reserves and balance, then the Postmaster General may divert and use such remaining portion for such purpose as he sees fit and the United States shall thereupon and thereby become obligated to pay an amount equal to the sum so diverted and used, to the Owner at the end of the period of Federal control, without interest.

SECTION FOUR

The Owner shall have the right to inspect its property at reasonable times during the period of Federal control and the Postmaster General shall provide reasonable opportunities for such inspection, but such inspection shall not interfere with the operation of the property.

SECTION FIVE

(a) During the period of Federal control, and until the Postmaster General shall inaugurate a different plan, the Owner's plan or practice for compensating employes on account of injury, disability, and death shall be continued. The Postmaster General shall, until the inauguration of such new plan, pay the expense of continuing and administering the present plan or practice, and shall pay any and all amounts upon the terms provided in the present plan or practice for compensating employes as aforesaid.

(b) The Owner shall, before they become delinquent, pay all taxes, license fees and charges, and the expense of suits in respect thereof, which can or may be lawfully imposed during the period of Federal control or other government authority upon any part of the property described in paragraph (a) of Section 1 hereof, and also such other taxes, license fees and charges as during the period of Federal control become the obligations of the Owner.

The Owner shall render bills to the Postmaster General for such taxes, license fees and charges as the same are paid, which bills shall be accompanied by receipts of the proper tax-collecting officials, and shall be paid by the Postmaster General within five days after their rendition, except that said bills shall not include and the Postmaster General shall not pay to the Owner, the portion of such taxes, license fees and charges properly apportionable to property not taken under Federal control and to the revenue from said last-mentioned property.

If any such tax, license fee or charge is for a period which began before July 31st, 1918, or continues beyond the period of Federal control, such portion of such tax, license fee or charge as may be apportionable to the period of Federal control, shall be paid by the Postmaster General and the remainder shall be paid by the Owner.

Whenever a period for which a tax, license fee or charge is imposed cannot be definitely determined, so much of such charge as is payable in any calendar year shall be treated as imposed for such year.

(c) During the period of Federal control, the Postmaster General shall pay all rentals for property used in the operation of the property of the Owner.

(d) Said taxes and rentals shall be allocated between the expenses of operation and capital accounts in accordance with the accounting rules prescribed by the Commission.

SECTION SIX

(a) For the use of the Postmaster General the Owner shall, out of the proceeds of securities to be issued by the Owner or otherwise, loan to the United States from time to time upon reasonable notice during Federal control, without interest, a sum not exceeding ..... dollars ($.....) in any one year, to be repaid to the Owner at the end of Federal control. Provided, however, at the option of the United States, that upon the return of the property at the end of Federal control said debt may be considered paid and satisfied to the extent, if any, that the United States may have contributed to the cost of additions made with the Owner's written approval.

(b) Such additions to the telephone property of the Owner's system as may be desired by the Postmaster General and approved in writing by the Owner as necessary in order to reasonably provide for the public requirements, giving priority to such requirements for purposes directly relating to the prosecution of the war (including in the word "additions" those made by consolidations and purchases) shall be made: Item (1), by investing the reserves set up for amortization and the unexpended balance of the reserves for accrued depreciation and after said funds have been exhausted; item (2), by investing the proceeds of the issue and sale of securities by the Owner (other than those issued by the Owner in securing all or any part of the loan referred to in paragraph (a) of this section), if such sale can be made at reasonable prices. Provided, however, that in case of expenditures made for such additions from funds from the sale of securities, only ..... of the cost of such additions shall be paid from such funds, the Postmaster agreeing to provide the remaining ..... of such cost; or, item (3), wholly out of funds furnished by the United States.

The title to all such additions made in accordance with items (1) and (2) above, shall immediately vest in the Owner.

(c) Any amounts which the Postmaster General may contribute to or pay for the cost of such additions shall be repaid to him by the Owner in twenty (20) equal annual installments; payable, one at the expiration of one year after Federal control and one at the end of each year thereafter until all are paid, with interest from the date of the end of Federal control at the rate ..... per cent (....%) per annum, payable annually upon all unpaid balances.

(d) The character, plan and design of such additions shall be approved by the Postmaster General and the Owner; the Postmaster General shall render to the Owner on the 15th day of each month accurate statements of the cost of all material and labor furnished by him for account of the Owner for such construction during the preceding month, which statements shall be based upon and in accordance with the accounting rules and classifications prescribed for the Owner by the Commission and in force July 31st, 1918, as from time to time amended. Upon such accounts there shall be credited any amounts then due and unpaid from the Postmaster General on account of the reserves provided for in paragraph (b) of Section 3, and the balance remaining shall be paid to the Postmaster General on or before the 15th day of the succeeding month.

(e) The Owner shall not be required, in the first instance, to furnish for such additions not approved by the Owner. At the end of Federal control, the value of each addition not approved by the Owner, for the future use of the Owner, shall be appraised by the Commission and at the end of Federal control, but not prior thereto, the title of such additions shall pass to the Owner and the amount so determined to be its value shall be paid to the Postmaster General by the Owner in twenty (20) equal installments, payable, one at the expiration of one year after Federal control and one at the end of each year thereafter until all are paid, with interest from the date of the end of Federal control, at the rate of ..... per cent (....%) per annum, payable annually upon all unpaid balances.

SECTION SEVEN

(a) The Postmaster General shall pay to the Owner for each year and pro rata for each fractional part of a year during the period of Federal control, an amount equal to the sum of the following four items: Item (1) the annual interest on all outstanding securities and obligations of the Owner in the hands of the public; item (2) ..... dollars; item (3) the annual charge for interest and dividends and other costs of securing necessary additional capital for such expenditures as may be made at the request of the Postmaster General; item (4) the annual charge for such interest and dividends as the Owner may be required to pay on new securities, obligations or share capital issued for the discharge, conversion or renewal of present obligations, and for additional interest and charges to secure extensions of existing securities or obligations.

Any securities or obligations issued by the Owner and purchased by and in the hands of Trustees, shall be treated as outstanding in the hands of the public.

It is hereby provided, however, the Owner shall not declare and pay to its stockholders any dividends in excess of ..... per cent annually during the period of Federal control.

(b) The amounts provided for under sub-division (a) hereof shall be paid to the Owner in monthly installments on the last day of each calendar month during the period of Federal control except that installments which have accrued prior to the acceptance of this proposal shall be payable at the date of such acceptance; such payments to the Owner to fully satisfy and discharge all claims of the Owner on account of the amounts so paid.

SECTION EIGHT

(a) All amounts received by the Postmaster General under paragraph (a) of Section 1 hereof, and all other amounts, whether received from the Owner in cash or collected or realized by him from prepayments and current operating assets belonging to the Owner or arising from telephone operations prior to midnight of July 31, 1918, shall be credited by him to the Owner; and the Postmaster General shall, to the extent of the cash so received or realized, pay and charge to the Owner all expenses arising out of its telephone operation prior to August 1, 1918, and unless objected to by the Owner, may pay and charge to such Owner any of such expenses in excess of the cash so received or realized. Balances of the above accounts shall be struck monthly as of the last day of August, 1918, and as of the last day of each calendar month there-

after, within fifteen days, and the cash balance found on such adjustments to be due either party shall be then payable within five days.

(b) Telephone operating expenses and rent deductions shall be allocated with reference to the time when incurred as between the periods prior and subsequent to midnight of July 31st, 1918, and between the period of Federal control and the period subsequent thereto, in each instance in accordance with the present established accrual practices of the Owner; telephone operating revenues and rent revenues shall be allocated as between the periods prior and subsequnt to midnight of July 31st, 1918, and as between the period of Federal control, and the period subsequent thereto, in each instance in accordance with the present established accrual practices of the Owner.

(c) Items included in accounts (1) No. 129, Prepaid Rents; (2) No. 130, Prepaid Taxes; (3) No. 131, Prepaid Insurances; (4) No. 132, Prepaid Directory Expenses, and (5) No. 133, Other Prepayments, which are sub-accounts of account number 128, as prescribed by the Commission, shall be allocated as between the periods prior and subsequent to midnight of July 31, 1918, and as between the period of Federal control and the period subsequent thereof, in each instance in accordance with the present established practices of the Owner.

(d) There may be used for additions to the Owner's property, approved by the Postmaster General, any of the materials and supplies taken over under paragraph (b) of Section 1 hereof, or purchased by him and held for use in connection with such property, insofar as in his judgment this may be done with due regard to his own requirements. Materials and supplies so furnished shall be charged to the Owner at inventory prices in the case of those taken over and at cost in the case of those purchased.

(e) The Postmaster General shall pay, or save the Owner harmless from, all expenses incident to or growing out of the possession, operation and use of the property taken over during the period of Federal control. He shall also pay or save the Owner harmless from all judgments or decrees that may be recovered or issued against, and all fines and penalties that may be imposed upon it by reason of any cause of action arising out of Federal control or of anything done or omitted in the possession, operation, use or control of its property during the period of Federal control, except judgments or decrees founded on obligations of the Owner to the Postmaster General or the United States.

(f) The Postmaster General shall save the Owner harmless from any and all liability, loss or expense resulting from or incident to any claim made against it growing out of anything done or omitted during the period of Federal control in connection with or incident to operation or existing contract relating to operations, and shall do and perform so far as is requisite during the period of Federal control for the protection of the Owner, all and singularly the things, of which he may have notice, necessary and appropriate to prevent, because of Federal control or by reason of anything done or omitted thereunder, the forfeiture or loss by the Owner of any of its property, rights, ordinance rights or franchises, or of its connecting or other contracts involving a facility of operation. The Postmaster General shall also save the Owner harmless from any and all claims for breach of covenant heretofore entered into by it or by any predecessor in title or interest in any mortgage or other instrument in respect of insurance against losses by fire.

Nothing in this or in the preceding paragraph shall be construed by the Postmaster General of, or to make him liable on, any obligation of the Owner to pay a debt secured by a mortgage.

(g) In carrying out of the provisions of paragraphs (a), (b) and (c) of this Section, the Postmaster General shall not settle any claim by or against the Owner against the objection in writing of the president or any other duly authorized officer of the Owner. The conduct of all litigation arising out of such disputed claims or out of operation prior to Federal control shall be in charge of the Owner's legal force and the expense thereof shall be paid by the Owner, but the Postmaster General shall render to the Owner all reasonable assistance in the conduct of such litigation.

(h) The Owner shall have the right at all reasonable times to inspect the books and accounts kept by the Postmaster General relating to the property of the Owner or to the operation thereof, and the Postmaster General shall during the period of Federal control furnish to the Owner periodically copies of operating reports relating to its property, and as soon as practicable after the end of each fiscal year, the statistical data for such year substantially as heretofore compiled.

(i) All payments to be made under this proposal which are not paid within five days after due, shall draw interest from the date of their maturity until paid at the rate .... per cent per annum.

SECTION NINE

(a) At the end of the period of Federal control all the property described in paragraph (a) of Section 1 hereof, and also all additions (including those made by consolidations and purchases) to the property of the Owner made during the period of Federal control out of unexpected reserves, out of the proceeds of securities, or otherwise, together with all repairs, renewals, and replacements thereof, shall be retruned to the Owner in a state of repair and in an operating condition equivalent to that of the Owner's telephone system on July 31, 1918.

(b) At the end of the period of Federal control the Postmaster General shall return to the Owner an equal quantity and quality of materials and supplies of equal relative usefulness to that of the materials and supplies which he received, and to the extent that the Postmaster General does not return such materials and supplies he shall account to the Owner for the same at prices prevailing at the end of the period of Federal control. To the extent that the Owner may then receive materials and supplies in excess of those delivered by it to the Postmaster General, it shall account for the same at the prices prevailing at the end of the period of Federal control, and the balance shall be adjusted in cash.

SECTION TEN

(a) At the end of the period of Federal control there shall be paid to the Owner an amount of money equal to the cash working capital, without interest, received by the Postmaster General from the Owner, and also an amount equal to any other cash and special deposits received by him from the Owner at the beginning of the period of Federal control and not theretofore accounted for by him, together with any unpaid interest which may have accrued upon the said other cash and deposits under this proposal. There shall be paid to the Owner any funds created under the provisions of this agreement, except to the extent that such funds may have been properly used under this proposal.

SECTION ELEVEN

(a) In this proposal, the words "Postmaster General" are used to designate Albert S. Burleson, or such other person as the President may from time to time appoint to exercise the powers conferred on him by law with reference to Federal control; the word "Commission" is used to designate the Interstate Commerce Commission; the word "additions" as used herein shall be understood to mean additions, betterments or replacements as defined by the Commission's System of Accounts (including extensions and improvements made through consolidations and purchases), the net cost of which, under such system of accounts, is properly chargeable to fixed capital, that is to say, accounts:

No. 100. Fixed Capital installed prior to January 1, 1913.

No. 101. Fixed Capital installed since December 31, 1912.

No. 104. Construction work in progress.

(b) Wherever reference is made herein to the System of Accounts of the Commission, it shall be understood to mean the Uniform System of Accounts and Rules for Class A Telephone Companies prescribed by the Commission as such system existed at midnight, July 31, 1918.

(c) Any patents or licenses thereof owned or controlled by the Owner may be used by the Postmaster General without charge by the Owner during the period of Federal control, but the right to such use shall not extend beyond said period, nor shall the use of patented devices owned by other individuals or companies, be construed to confer any right upon the owner herein to use or to control the use of such devices subsequent to the termination of Federal control; nor shall the use during the period of Federal control of patented devices covered by patents of the owner on property other than that of the Owner be construed to confer the right to continue such use after the termination of such period.

(d) This proposal, if accepted by the Postmaster General, shall be effective on and from midnight, July 31, 1918.

Dated this ....th day of ....., 1918.

..... TELEPHONE COMPANY,
By President and its Subsidiary.

Association Interpretations and Comment

By F. B. MacKinnon, Vice-President United States Independent Telephone Association

Accounting Procedure Under Order 1931 and Bulletin 8. Bulletin 8 of the Telephone and Telegraph Administration of the Postoffice Department establishes service connection charges which include what are classified by the Interstate Commerce Commission as installation charges and charges for all classes of moves and changes of name. In order to avoid confusion, telephone companies will continue to follow the rules laid down by the Interstate Commerce Commission until otherwise specifically ordered by the Postmaster General. This means that for the purpose of collecting charges from the subscriber for installations, moves and changes of name, the Postmaster General's Orders as contained in Order 1931 and Bulletin 8 should be followed. In distributing the charges and credits for material and labor used in making the installations and moves the procedure prescribed by the Interstate Commerce Commission should be followed in the same manner as if the Postmaster General's orders had not been issued.

Division Heads. Bulletin No. 7, issued by the Postmaster General, provides "the claims for deferred classification shall be sworn to by the supervising officer under whom the employe works. However, before filing the claim with the local exemption board it must be approved by the division head in charge of the territory in which the employe is registered." The question has been asked by a number of companies as to what is meant by the expression "division heads." In order to avoid any misunderstanding and delays, independent company exchange managers should make claims for deferred classification for men working under their jurisdiction except in exchanges of sufficient size to have plant superintendents, traffic managers or commercial managers, in which case those officers should make the claims for deferred classifica-

tion, which should be approved by the exchange manager. Where the company desires to claim deferred classification for an exchange manager, the claim should be sworn to by his immediate superior officer, whether that officer be the general manager of the company or the president of the company. There have been no divisions made by the Postmaster General, and consequently no official division heads appointed. The term is used in the Postmaster General's bulletin as applied in the postal telephone service.

Explanation of Order 1931 and Bulletin 8. Owing to many inquiries received that indicate the need of more detailed interpretation, a circular prepared by the association supplants association interpretation of order 1931 and Bulletin 8 of September 14, and includes answers to many questions that have been asked. It is reproduced below. In this connection we desire to explain to members that it is impossible to give prompt attention to all inquiries, and that members should understand that if there is any delay in answering their letters, it is due to causes beyond the control of the association. It is our plan to issue bulletins as frequently as we obtain information of importance and interest to our members. We will in some instances delay answering inquiries because these inquiries will be answered by a bulletin about to be issued. We hope members will continue to write us whenever any questions arise, so that we may be informed as to the problems of our companies and as to whether our interpretations of orders are stated sufficiently clear so that they are understood by all.

Additional Association Interpretations of Order No. 1931 and Telegraph and Telephone Service Bulletin No. 8

YEARLY CONTRACTS.

1. Are yearly contracts prohibited?

Applications for service cannot require the subscriber to continue the service established for more than a month. The payment of the service connection charge by him gives him the right to terminate that service at any time, but payment of less than one month should not be accepted except where contracts now provide for day to day service. But no company can charge more for a month's service than the regular monthly rental charge for that service plus the service connection charges.

SHORT TERM CONTRACTS.

2. Where a subscriber at a vacation resort makes application for service, what charge shall be made?

The regular service connection charge and the regular rate for each month's service whether the service is continued one month, or three, or six. This rule should be applied in all cases hitherto handled by short term rates.

RATES, MINIMUM NET.

3. What is meant by "minimum net rate"?

(a) Some companies allow a discount from their filed rates for prompt payment. The amount to be paid by the subscriber after this discount has been deducted is in this instance the "minimum net rate."

(b) Reduced rates are sometimes given to religious, charitable, and organizations incident to the War such as the Red Cross and War Savings Committees. The amounts paid by such organizations are "minimum net rates."

(c) Where measured service rates (message rates for exchange service) are in effect a subscriber guarantees a minimum payment per month, that payment is the "minimum net rate."

RATES, VACATION.

4. What shall be done with vacation rates?

Companies should establish vacation rates; that is, a rate should be filed and charged for the period when a subscriber is absent from his residence. Many companies charge a half rate for such service. Such a rate should be charged, and the practice of discontinuing service during vacation periods should stop. There must be no lapse of service. There is a lapse of service if that service is discontinued for any period. Where no vacation rates are in force and service is discontinued, it can be restored only by the payment of the proper service connection charge.

5. Does the instruction in No. 4 apply to the re-establishing of service during September and October, 1918, when the company, pursuant to its practice, discontinued the service during the vacation months, the subscriber expecting in good faith to have the service re-established upon his return without service connection charges?

No. Nothing in Order 1931 and Bulletin 8 instructs a company to violate its contracts. If by written contract or established practice a company has re-established service at the end of vacation periods without special charges, then that company should make no special charges at this time but should notify all subscribers that contracts are terminated in accordance with the cancellation clauses of their contracts, and that practices have been changed to meet the Postmaster General's orders. Vacation rates should be established and filed. All necessary steps should be taken to do away with all restrictions that prevent the application of the Government's orders without discrimination.

CHANGE OF RATES.

6. When a subscriber changes from a $1.50 per month to a $2.50 rate, is there any service connection charge to be made?

Yes. It is to be assumed that the subscriber paid the $5.00 service connection charge when his service was first established (at any rate he is in the same class as a man who has paid that charge). Therefore, when he changes to a higher rate he should be charged the service connection charge based on that rate, from which should be deducted the service connection charge it is assumed he has paid for his present service.

For example, if the subscriber changes from a $1.50 per month rate to a $2.50 rate, he will be required to pay $5.00 which is the difference between the $10.00 service connection charge for the higher rate less the $5.00 service connection charge for the lower rate which it is assumed he has previously paid.

7. When a subscriber changes to a lower class of service, for instance from a $2.50 per month main line service to $1.50 per month party line service, what should he pay?

No charge has been authorized to cover such a change. (In reality to be consistent, he should be required to pay the service connection charge for the $1.50 per month service the same as for an "outside move," which is what the change involves, but in the absence of instructions companies should impose no charge.)

CHANGE IN NAME.

8. A and B are partners. A buys out B's interest and continues the business. The telephone service goes on with no change in location or lapse in service and A makes no formal application for change in directory listing or change of account name. Does change in name apply?

No. So far as the telephone company is concerned there has been no change in name.

9. If under the above transaction A makes application for change in listing and account name, does change in name apply?

Yes.

CHANGE IN EQUIPMENT.

10. Does the changing from a wall set to a desk set, or vice versa, involve a move charge?

No. Changes in equipment furnished at the same location are to be handled on the basis of cost of labor and material.

MOVE, LAPSE OF SERVICE.

11. Can a subscriber, who moves into an office or residence where an instrument is installed, but where there has been a lapse of service, obtain the benefit of the "change of name" charge instead of the "service connection charge" by paying the back rental from the time the former occupant of the residence or office moved out?

No. There has been a lapse of service and the payment of the back rental cannot change the conditions.

NO LAPSE OF SERVICE.

12. In the above instance to re-establish the service the company is not required to do any plant work, is obliged only to change its office and traffic records—therefore should the service connection charge be made?

Yes. As explained in Association Interpretations of September 14, the charges are general and not based on any particular item.

13. Does the change of name charge apply where A gives notice of his intention to move and orders his telephone service discontinued and before the date of that discontinuance B applies for service in that place?

Yes.

LAPSE OF SERVICE.

If B applies for service at the place A has vacated the premises and service has been discontinued, can he claim the change of name charge, instead of a service connection charge if he assumes the rental charges from the date A's service was discontinued?

No. There has been a lapse of service.

CHANGE OF SERVICE.

14. B moves into A's former residence before A's service is discontinued, and desires the change from the party line service A has had to a main line. What does B have to pay?

First: Change of name charges.

Second: The difference between the service connection charge, applicable to the higher class of service and that applicable to the lower class of service which A has had. See Questions 6 and 7.

NO CHANGE.

15. A and B are rural subscribers on the same party line. They exchange residences with no change of number, listing, etc., and no lapse of service. Does the change in name charge apply?

No.

CHANGE IN ADDRESS ONLY.

16. If the above transaction changes A and B's post office address will the change of name charge apply?

Yes. Because the notice of the change must be made to the Company. Under Case 15, in so far as the company is concerned, no change has taken place.

COLLECTION FOR INSIDE MOVES.

17. Is it necessary to collect for inside moves in advance?

No. In many cases inside move charges which include charges based on costs cannot be determined in advance.

ENTITLED TO ONE MOVE.

18. Where a contract provides that the subscriber, during the first twelve months the contract is in force, is entitled to one move without charge are the new service connection and inside move charges to be applied?

No. If the first twelve months' period has not expired and the contract with the subscriber has not been cancelled as advised in No. 5, then the contract provision should prevail.

FOR EQUIPMENT OTHER THAN TELEPHONES.

19. Under paragraph 6 of Bulletin No. 8 it is stated the charge for moving all equipment other than telephone sets, "from one location to another on the same premises shall be based on the cost of labor and materials." Does this prevent the company from establishing an average cost rate for such moves and thereby aid in dealing with the public and economize in accounting?

Such an average cost rate can be established. The Order says the charges shall be based on the cost of labor and materials. It does not say it shall be the cost of labor and materials. In competitive situations, the managers of the Independent and Bell Exchanges should co-operate in arriving at the average cost rates to be charged so that all subscribers in their city shall be charged the same rates.

ON SAME PREMISES.

20. What is meant by the phrase "same premises" in paragraph 6 of Bulletin No. 8 in connection with the inside moves?

This term is to be applied to the building or the part of a building occupied by the subscriber either as a residence or in the conduct of his business. Examples are:

(a) A subscriber occupies offices on two separate floors of a building. All such rooms so occupied by him are part of the same premises as the term is used in Bulletin No. 8, and the inside moves charge will apply to the moving of the telephone set from a room on one floor to a room on another floor.

(b) If the subscriber rents additional adjoining rooms in the same building, the moving of his telephone set to one of those new rooms will be considered an inside move.

(c) If the subscriber rents entirely new rooms and vacates the ones in which his telephone service is installed, the moving of the telephone equipment will be classed as an outside move subject to service connection charges.

(d) The subscriber makes use of more than one building on the same plot of ground or adjoining plots. Will the moving of his telephone from one building to the other be classed as an inside or outside move? An outside move subject to service connection charges.

P. B. X. INSTALLATION.

21. Where the company's practice provides that all costs of installation incident to the installation of P. B. X. and intercommunicating systems are to be charged to the subscriber, are the service connection charges to be added to those charges?

Yes. Paragraph 8 of Bulletin No. 8 specifically

states that the service connection charges do not supersede special installation charges.

BATTERY CIRCUITS.

22. Does the service connection charge apply to battery circuits supplied in connection with P. B. X. service?

No. Such circuits should be classed with the special equipment mentioned in paragraph 3 of Bulletin No. 8.

CONTRACTED ADDITIONS TO EQUIPMENT.

23. Where the company, prior to September 1st, installed a private branch exchange and contracted to furnish additional trunks and stations at stipulated prices, do the service connection charges apply to each additional trunk and station installed?

They do if the Company has regular filed rates for P. B. X. trunks and stations and if at the time the contract was made the rate for trunks and stations was specified. But if no rates are filed or have been quoted, then the additional equipment would be regarded as a special installation to which service connection charges will not apply. This can be also instanced as follows: Some companies quote rates for P. B. X. trunks, but do not quote rates for the switchboard or additions to the switchboard. The installation of new trunks would require service connection charges but additional equipment for the switchboard would be special and not involve a service connection charge.

CHANGE TO P. B. X.

24. Where the subscriber changes to a P. B. X. system from the using of several individual lines and instruments, what service connection charge should he pay?

It should be assumed that he paid a service connection charge for each main line station and extension set. The sum of these service connection charges should be deducted from the sum of the service connection charges for all of the P. B. X. service applied for. The difference will be the amount he should pay.

P. B. X. MOVE.

25. Does the "moving charge" of $3.00 provided in paragraph 6 of Bulletin No. 8 apply to the moving of P. B. X. stations?

Yes. Where an entire P. B. X. is moved the cost of the move shall be ascertained and from this deducted the amount for moving the stations at $3.00 per station. The balance should then be billed as the amount due for moving all the equipment except the stations. The total for the moving of the stations should be billed as a separate item.

FREE SERVICE.

26. Where service is being donated to Red Cross, Liberty Loan Committees, etc., is the service connection charge to be collected?

No. In the absence of a general order against donations of service if donation of rental service is permissible, donation of service connection charges is also.

EXTRA SERVICE.

27. Where A rents a room or desk space from B and applies to have his name listed in the telephone directory under B's number, what should he pay?

What A is applying for is an extra service to which service connection charges do not apply. Therefore, there will be no charge in addition to the company's regular charge for extra listing or two-name service.

FROM THE GOVERNMENT.

28. How shall the collection of service connection and move charges from Government departments be handled?

Many of the Government departments and bureaus are prevented by statute from making advance payment of any kind. Companies should attempt to collect in advance only from those departments or branches of the National, State, County or Municipal Governments that have contingent funds available for advance payments.

SERVICE STATIONS AND SWITCHING SERVICE.

29. What is meant by "service stations" and "switching service" in paragraph 8 of Bulletin No. 8?

Among Independent companies the term "switching service" is applied to the service that is given those rural lines, the pole lines and equipment of which is owned and maintained by the farmers—the service of the telephone company being confined to supplying the switchboard connections and the circuit to a meeting point with the circuit owned by the farmers, which meeting point is generally at the city limits. Among the Bell companies such rural subscribers are known as "service stations" to distinguish them from the rural subscribers whose entire equipment and service is supplied by the telephone company.

It is often the practice of both Independent and Bell companies to rent telephone instruments to farmers for use in connection with this switching service. Sometimes the company installs the telephone, charging for time and material, and sometimes the farmer makes his own installation. The rental charged for the instrument and the cost of installation are not classed under Bulletin No. 8 as service charges and service connection charges do not apply.

COLLECTION OF SERVICE CONNECTION AND OTHER CHARGES.

30. Where installations, moves, and changes of name have been made since September 1st and collection of the charges were not made at the time of application for such a move, change of name, or installation, is the company expected to make collection?

Yes, and if payment is refused service is to be discontinued according to the same procedure applied by the company in connection with the discontinuance of service for non-payment of rental bills.

DISCONNECTION FOR NON-PAYMENT.

31. When a subscriber is disconnected on account of non-payment of bills, is the service connection charge to be collected before service is re-established?

If complete disconnection has been made the service connection charges should be collected before the service is re-established. Until a specific order is issued by the Postmaster General as to discontinuance for non-payment, companies should continue to follow their practices. Many companies allow a certain period after discontinuance of service in which the subscriber can pay and service be continued. Under such procedure the service connection charges would not be imposed before service would be re-established, but if complete disconnection has been made at the end of any such conditional period, service connection charges should be collected before the service is re-established.

PAY STATIONS.

32. Since service connection charges cannot apply to Public Pay Stations and should apply to coin-box, semi-public stations in use in many drug stores and other business houses, what rule should apply to distinguish between the two?

An exact definition of either class is difficult and care should be exercised in applying any rule. In general a Public Pay Station is one for which the subscriber assumes no responsibility except as he acts as the agent of the company and by whom he is paid for

so acting. For a coin-box, semi-public pay station the subscriber assumes some responsibility, receiving no commissions and in most instances guaranteeing a certain return, and the installation of which he can require under the company's established practices.

PRIVATE EQUIPMENT.

33. Will private line equipment such as circuits and stations interconnected but not connected with the central office for exchange service be subject to service connection or move charges?

No.

ZONE MILEAGE.

34. Is the added charge for zone mileage subject to service connection charges?

If the charge is a flat rate for service and an additional amount for each mile beyond the city limits, then only the amount of the flat rate governs the amount of the service connection charge. But if there be several classes of flat rates based on mileage from the central office, then the service connection charge is based on the flat rental rate for the zone in which the subscriber is located. For example, if the rate for main line service is $1.50 and there is a mileage charge of $2.00 per month for each mile beyond the city limits, then the service connection charge will be $5.00. But if the rate is $1.50 within the city limits and $2.50 anywhere within the first mile beyond the city limits, the service connection charge will be $10.00.

Postmaster General Writes Minnesota Commission

The Postmaster General has written the Minnesota Public Utilities Commission answering its protest against installation and moving charges.

"For your information I will state at the outset," says the Burleson letter, "that the telephone companies are temporarily operating the properties for the Government account and are not interested in this matter.

"Compensation for the Government use will be fixed without regard to installation charges. I may say further that these charges have not been fixed at the request of the telephone companies, but have been ordered by me to meet a public necessity growing out of the scarcity of materials as well as the increased cost of labor."

Referring to the charges in his order concerning installations and removals of telephones, Mr. Burleson says:

"They were not based upon usual and normal commercial policies, but are due to the necessities of conserving material and labor. If it were necessary to justify the charges specified in order No. 1931 exclusively on the basis of cost, the following facts might have been submitted:

"A very large part of the cost of furnishing the public telephone service is due to the fact that the telephone systems must be prepared to connect new subscribers on demand, and to the fact that the period of service is comparatively of short duration on the average.

"Some of these costs due to the rapid turnover of telephone developments are obvious, such as commercial, traffic and accounting expenses for operating accounts, and the plant expenses involved in establishing connections and in disconnecting telephones, including loss incident to wiring, terminal depreciation, etc.

"The greater part of the expenses which are due to the movement of the telephone population, or what might be termed the shortness of life of the average telephone installation, are not at all apparent."

J. C. Koons, head of the operating department of the telephone companies, now under government control, has sent out information that the companies will not be authorized to make donations to charity or subscriptions for war activities. He says this would "represent contributions by the Government itself and be illogical and unauthorized." Officers and employees may contribute individually. The telephone companies have been liberal subscribers to all war and charity activities in the past and will be affected by the new ruling.

The Government is planning, says a Washington dispatch, to put a stop to "nickel grabbing" at hotel and cigar store telephone pay stations. It is prevalent in every city in the country, and scores of complaints have been lodged, but the wire administration of the Post Office Department had already taken notice of the situation and had referred the matter to its committee on uniform rates, of which David J. Lewis is chairman.

The practice has been for operators running switchboards at public pay stations to charge twice the franchise rate for city calls. If the established rate is 5 cents the charge has been 10 cents; and if the rate has been 10 cents, the charge has been 20 cents.

In some few states the public service commissions have regulated this abuse, as in Ohio where the pay stations in hotels are restricted to a 5-cent charge on city calls.

Increased effective November 1 for the Citizens Telephone Company of Kentucky and the Cincinnati and Suburban Telephone Company were approved by Postmaster General Burleson. Kentucky telephone companies do not report to a utilities commission. The Cincinnati rates to which those of the Kentucky company are permitted to conform, previously were approved by the Ohio state utilities commission.

Washington Investigates Detroit

Representatives of the city of Detroit, Mich., attended a hearing in Washington on the lcoal telephone rate situation. The hearing was proposed by the postmaster general's office, first notice coming to Mayor Marx of Detroit in the following telegram from Acting Postmaster General J. C. Koons:

"Representations made to this department are to the effect that telephone service at Detroit is so very bad that present rates are insufficient to maintain a satisfactory standard of wages to hold employes who are going into other lines of business, and that there is a threatened breakdown in the service. Can you send here at once, for conference, representatives best informed on your rate situation and present condition of service?"

The telegram does not state who made the representations. The last formal action in the Detroit telephone controversy was last spring when the Ingham county circuit court ordered the railroad commission to review its order establishing higher rates. At present this order is before the supreme court on an appeal.

Mayor Marx replied to the telegram of Acting Postmaster General Koons, inquiring about the threatened breakdown to telephone service and said none is imminent.

The mayor stated in his telegram that the rate dispute between the city and telephone company had recently been argued in the state supreme court and that a decision is pending, but that he could send representatives to Washington to confer with the postal authorities, October 25.

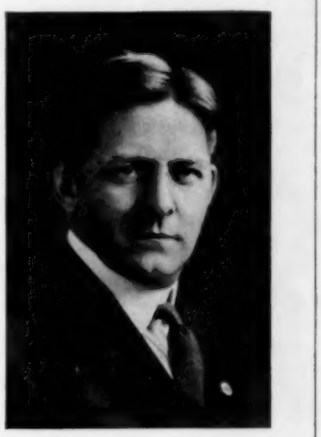
Service Standards Precede Rate Standards

A Basis for Scoring Magneto Plant Performance and Establishing Quality Values

By H. N. Faris

POSTMASTER General Burleson having appointed a committee to investigate the feasibility of standardizing rates, it is up to the more progressive magneto exchanges to force upon the notice of the Postmaster General and his committee that the latitude of service quality is many times wider in the smaller magneto plants than in the large common battery plants, and that these wide variations in service-giving ability must be taken into consideration before rate standards can be arrived at for magneto plants.

The proposition of "scoring" magneto plants has been a hobby of the writer ever since the establishment of state commissions with rate governing powers. We can see no reason why a full metallic magneto plant, in ideal condition, cannot be assumed as a 100 per cent good and actual existing plant scored from such standard on a purely mathematical basis by applying fixed deductions for defects found and the extent to which they are present. As it is possible to score a live animal by deducting imperfections from a perfect score and as inanimate insurance "risks" are scored in like manner throughout the world, it is certainly high time that a similar system be put in practice applying to telephone exchanges.



H. N. Faris,
Sales Manager Kellogg's Kansas City Office

The writer believes the quality of the plant and management should receive more attention than it does at the usual "hearing." Instead of attempting to determine the character of the service from the oral testimony of perhaps 1 per cent of the patrons, we believe the service rendering ability of the plant should be expressed in a percentage figure by the application of a fixed system of scoring to conditions found leaving as little as possible to the personal bias of the scorer.

Regulatory bodies can then tell whether the plant they are passing on is in 80 or 8 per cent service giving condition, and, if testimony given, shows the service is not satisfactory, they can tell whether the plant or the management is the real cause of the difficulty.

It is well known that under present conditions a manager who is a "good mixer" with his patrons can "get by" with a poor plant better than a manager of less personality can with a good plant and regulatory bodies have a right to know whether they are passing on a good plant well managed, a good plant poorly managed, a poor plant well managed or a poor plant poorly managed.

Heretofore, the good plant well managed has usually stood out for itself, but in the other three classes, and with the two intermediate ones in particular, commissions have been badly at sea as to the cause of the apparent trouble and the proper remedy for it.

In tentative systems of scoring magneto exchanges prepared by the writer, we find the above mentioned percentages are not an alliterative exaggeration as magneto plants in the small and medium sized towns throughout the southwest will actually score all the way from 8 to 80 per cent, a very few scoring higher than the latter figure as against an ideal metallic circuit standard.

In the tentative system compiled by the writer, magneto exchanges have been divided into three classes according to whether the subscribers' lines are "metallic," "mixed" or "grounded."

"Metallic" magneto exchanges are those in which 95 per cent, or more, of all subscribers line circuits (exclusive of rural lines) are two-wire loops from the central office to the subscribers' telephones.

"Mixed" magneto exchanges are those in which less than 95 per cent, but more than 5 per cent of all subscribers' line circuits are "metallic," as above defined.

"Grounded" magneto exchanges are those in which 95 per cent or more of all subscribers' lines are single wire with ground return (or a "common return" wire, serving two or more lines) from the subscriber's telephone to the central office or to the cable terminal. "Common return" lines and "ground return" lines will both be classed as "grounded," even though carried metallic through the cables and grounded at the outer cable terminal.

A 100 per cent perfect magneto exchange is assumed to be made up as follows:

Central office switchboard equipment, 100 per cent good	25 points
Central office protective equipment, 100 per cent good	2 points
Central office power ringing equipment, 100 per cent good	3 points
Cables and cable terminals full metallic, 100 per cent good	22 points
Pole lines, guys and messenger, 100 per cent good	10 points
Open wire distribution full metallic and 100 per cent good	15 points
Drop wires and interior wiring, 100 per cent good	3 points
Subscribers' stations equipment, 100 per cent good	20 points
Total credits for 100 per cent perfect Magneto Exchanges	100 points

Each separate heading to be scored separately on a basis of 100 per cent for perfect condition with proper deductions from the perfect percentage for defects as specified in detail instructions, and only the remaining percentage of the number of points creditable to this heading to be set down as a part of the final score for the entire exchange. Thus if the condition of the central office switchboard is found to be 60 per cent, only 60 per cent of 25 points, or 15 points shall be credited to the exchange, and if after scoring each separate heading in like manner the sum of the

points credited to magneto exchange as a whole may be accurately described as 65 per cent.

Each group taken by itself is further subdivided with explicit directions for making tests and what deductions to make for defects found in proportion to their extent and we believe it possible, with further refinements which more practical plant and equipment experts would be able to suggest, for any two experienced and intelligent plant men to score any magneto exchange independently and arrive at practically the same percentages for the several divisions and with practically no variation in the final summed up result.

We shall be glad at any time to go into the matter further with the accredited representatives of any regulatory body or with the representatives of any progressive association or company appreciating that the time has come when those maintaining their plants in better service giving condition must demand proper recognition inasmuch as it is an important factor which can be mathematically expressed and in regard to which such mathematical expression should take the place of the indefinite guess work so largely indulged in heretofore.

[Editor's Note:—Mr. Faris has prepared a complete exposition of his method of scoring telephone exchanges on the basis of service condition. This article, with diagrams of the testing equipment used by the author in his work, will be published in the December number of Telephone Engineer.]

Big Service Offering Drive

A partnership drive for the largest service offering of money ever subscribed by a single nation will begin on November 11 when the seven welfare organizations of the United States league themselves together in the United War Work Campaign for $170,500,000. The organizations joining in the single call upon the public are the Young Men's Christian Association, the Young Women's Christian Association, the National Catholic War Council, the Jewish Welfare Board, the War Camp Community Service, the American Library Association, and the Salvation Army.

It is a call upon the industrial army to help the fighting army. The men in the ranks whom the United War Work Campaign assists today are the men of the mills and the shops and the factories after the war. Many of them are men who will only come back to industry because a welfare organization sent from here over there has helped them to keep their health and their spirits and their grip on home. It is a call upon industry which has been enlarged and spurred on by war conditions. The whole people of the United States will contribute the funds, the seven organizations will distribute them, and all men in the ranks will receive.

Fleet Corporation Uses Automatic

An automatic telephone system is to be installed in all buildings of the Emergency Fleet Corporation at Philadelphia.

In keeping with the policy of the War Industries Board to conserve paper, the Fleet Corporation's new telephone directory has loose leaves, by which it is hoped to avoid the necessity of reprinting the entire directory as changes and corrections are made.

California Transfers

A deed transferring the plants and franchises of the Pacific Telephone and Telegraph Company in Long Beach and San Bernardino, Cal., to the Union Home Telephone and Telegraph Company, was filed October 9 at the county recorder's office. The consideration was $360,000, and the deed carried $360 worth of war revenue stamps.

The transfer includes lines, both aerial and underground, poles, exchange fixtures and rights of way but not the office buildings or real estate in either city. The lines from the drawbridge at Long Beach to Terminal island are also excepted in the transfer.

The legal forerunner of a physical consolidation of the two telephone systems at San Diego occurred September 28 when Attorney Leroy A. Wright filed with County Recorder Ferry a conveyance turning over the entire real and personal property of the Home Telephone Company to the Pacific Telephone and Telegraph Company better known as the Sunset system.

The deal has been pending for months, and the conveyance practically clears up all of the legal details in the transaction. Attached to the papers was $650 worth of internal revenue stamps. The actual merger, with interconnected service, is promised soon.

Convention in Illinois This Month

Dr. R. E. Gordon of El Paso, Ill., secretary-treasurer of the Illinois-Indiana Independent Telephone Association, announces a convention to be held at Peoria, Ill., November 6, 7 and 8. It is anticipated that several hundred will attend, including about 50 ladies.

An operators' school will be conducted morning and afternoon of November 6 and 7 and morning of November 8.

The sessions will be held at the Jefferson hotel and the program contains both business and entertainment features. Especial arrangements for the pleasure of the ladies are being made. The delegates will enjoy a banquet and likewise a smoker.

E. D. Glandon of Pittsfield is president of the association and B. W. Burke of Carlinville is vice president.

C. B. Hadfield, manager of the Interstate Telephone Company, is named as chairman of the reception committee.

Ohio Wire Injunction Stands

The temporary injunction recently granted the Ohio State Telephone Company enjoining the Massillon Electric and Gas Company from stringing high tension wires on the telephone company's property on Walnut street, Massillon, Ohio, was allowed to stand by Common Pleas Judge Ake following a hearing October 13.

The Massillon concern held that its action in stringing the high tension wires carrying 22,000 volts was a war necessity, because the wires were feeding plants engaged in government work. The telephone company, on the other hand, argued that the high power wires were a menace to the lives and property of residents living in that section, and that the wires interfered with the telephone service.

Design of Transpositions for Parallel Power and Telephone Circuits

Presented at the Convention of the American Institute of Electrical Engineers—Continued from October

BY HAROLD S. OSBORNE

DETERMINATION of Limiting Permissible Exposures—Before the attempt can be made to select, from among the typical arrangements of transpositions, which can be used, a type for each telephone circuit on the lead, a table is made up of the limiting type unbalances which can be permitted between pairs of cirsuits, assuming that a given limit of the induced current between circuits cannot be exceeded. The procedure is as follows:

1. A computation is made of the total amount of unbalance which could be permitted between each combination of circuits on the lead, taken two at a time. This unbalance is expressed in terms of the length of untransposed exposure between the circuits which would give the limiting value of induced current, no current being induced in the rest of the circuit.
2. The total allowable unbalance for each pair of circuits is reduced by a figure representing the unbalance which must be expected to arise from irregularities with the type of construction to be employed.
3. The remaining unbalance represents the limiting permissible effect of type unbalance in a long length of line.
4. From data regarding the attenuation of currents along the telephone circuits, and from the total limiting effect of type unbalance, a computation is made of the limiting type unbalance per transposition section. This sets a direct limit on the relative exposure type between each pair of circuits.

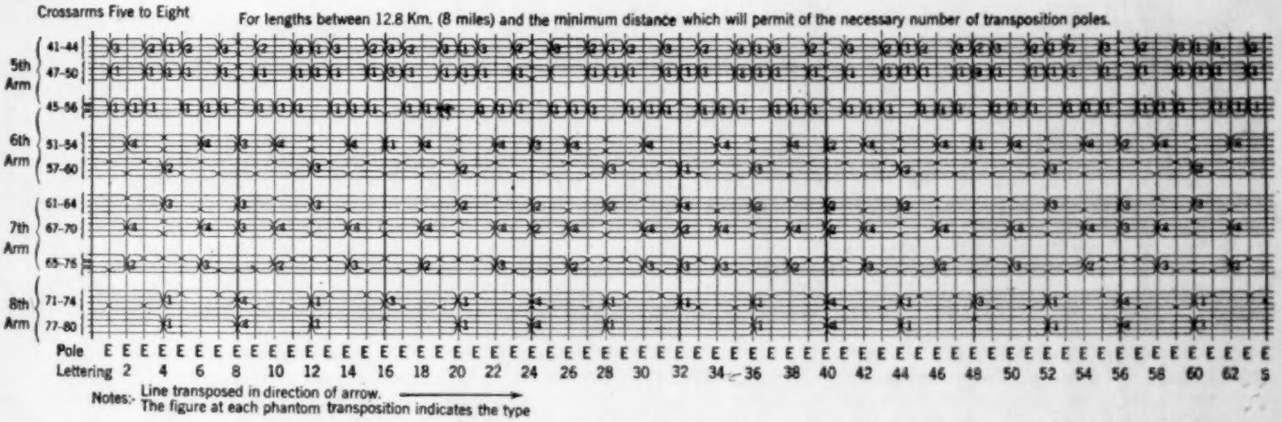

Crossarms Five to Eight
For lengths between 12.8 Km. (8 miles) and the minimum distance which will permit of the necessary number of transposition poles.
5th Arm
41-44
47-50
45-56
6th Arm
51-54
57-60
7th Arm
61-64
67-70
65-75
8th Arm
71-74
77-80
Pole
Lettering
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62
Notes:- Line transposed in direction of arrow.
The figure at each phantom transposition indicates the type

Fig. 8.—E Section—Transposition System for Phantom Circuits on Exposed Telephone Lines—Arrangements for Phantoming All Circuits.

The Design of a Transposition System. With the information regarding the requirements of the proposed transposition system prepared as indicated above, the creation of a design which shall meet the requirements of maximum economy and efficiency is a problem requiring a great deal of skillful and conscientious application on the part of a trained expert. The problem is of course one of selecting from the typical arrangements which can be used the best type for each circuit such that the type unbalance between no two circuits will exceed the established limit.

In order that a design may be complete it must provide for any number of crossarms on the telephone lead. However, it is generally desirable to take into consideration only four crossarms at the beginning of the design. Considering all the circuits, phantom and two-wire, which may be placed on the lead, taken in combinations of two there are about 2500 such combinations on a standard 40-wire pole line.

In carrying out the design of the exposed-line transposition system it was desired to make the requirements both of efficiency and economy as exacting as could possibly be met. These requirements were set, therefore, at the beginning of the work, so high that no design could meet them, and then gradually reduced until it was possible to complete the design. As the design depends on a number of interdependent requirements, this process not only requires a very large amount of work but demands the continual exercise of trained judgment on the part of the designer to bring about the mutual adjustment of requirements so as to produce the best final result.

The process of determining whether or not a design can be established to meet a given set of requirements is very technical and will not be described here in detail. It involves a systematic consideration of all the possible arangements. These possibilities are very great in number—about seven million in the case of the *E* section design—and are, of course, not considered individually, but in groups, and successive groups of possibilities are rejected when it has been proved that they could not meet the requirements.

The systematic grouping of the possibilities, and the means adopted for the examination and elimination of the groups depends a great deal upon the experience and skill of the designer. The general method which has been successfully employed can be roughly described as a consideration of the design in steps. First the attempt is made to carry through a preliminary design in which pairs of circuits which cannot be exposed to each other untransposed for the entire length of the transposition section (*P* exposures) are provided with different typical arrangements of transpositions, but in which no other requirements are considered. If this

design is possible, the other balance limitations of the types selected are added, one by one.

When a design is finally reached it is usually found that any one of a considerable number of arrangements will meet the balance requirements almost equally well. The most economical of these is chosen for use. In determining upon the relative economy of different designs, account is taken of the extent to which circuits on different pin positions will exist in the telephone plant and the extent to which it might be possible, in retransposing existing lines, to use the present transpositions as a part of the transpositions called for in accordance with the new system.

EXPOSED-LINE TRANSPOSITION SYSTEM

Special Electrical Requirements. The exposed-line transposition system was designed to meet the following special electrical requirements:

1. The greatest practicable flexibility for the arrangement of transpositions in power circuits paralleling the telephone circuits, the power circuit transpositions co-ordinating with those in the telephone circuits so as to produce a balance of the inductive effects. This requirement to be met for transpositions both in three-phase circuits and in single-phase circuits.

2. A suitable balance against the inductive effects of telegraph circuits or other ground return circuits paralleling the telephone circuits.

3. A degree of freedom from interference between the telephone circuits (crosstalk) suitable for modern high grade telephone circuits used in connection with loading and with telephone repeaters.

General Requirements. In addition to these special requirements, it must meet the following requirements for any satisfactory transposition system:

1. *Neutral Points.* The system must be arranged so that neutral points, that is, points at which a maximum degree of balance is obtained between all circuits on the telephone line are provided where there are discontinuities in line construction or in the parallel. In the case of open wire toll lines of the Bell telephone system, there must be neutral points at regular intervals of about 12.8km. (actually 7.88 miles). In addition there must be neutral points wherever there is an important junction between telephone lines and at other points of discontinuity. It is, therefore, desirable that the system include a design intended for a maximum length of 12.8 km. and another for shorter maximum distances.

2. *Cost.* The completed section must be designed for as low a cost as practicable without sacrifice of the electrical requirements. This means that as far as other conditions of design permit, the typical arrangements having the least numbers of transpositions should be placed on the circuits most often used. In general, it is desirable that phantom circuits have fewer transpositions than two-wire circuits as phantom circuit transpositions are the more expensive.

3. *Transposition Poles.* It is desirable that the transposition poles be as few in number as practicable not only on account of expense but because the use of large numbers of transposition poles limits the minimum length of a transposition section. The use of many poles may also tend to increase the induction.

E Section and L Section. As a result of the study, two designs have been completed which are called respectively the *E* section and the *L* section. Diagrams showing transpositions according to the *E* section for crossarms 1 to 8 of a pole line are shown in Figs. 4 to 9, inclusive, and according to the *L* section in Figs. 10 to 15, inclusive. It will be noted by examination of the figures that the designs provide for the phantoming of any two horizontally adjacent pairs or of any two vertically adjacent pole pairs on the lead. In carrying out the designs provision has been made for extension if necessary to any number of crossarms.

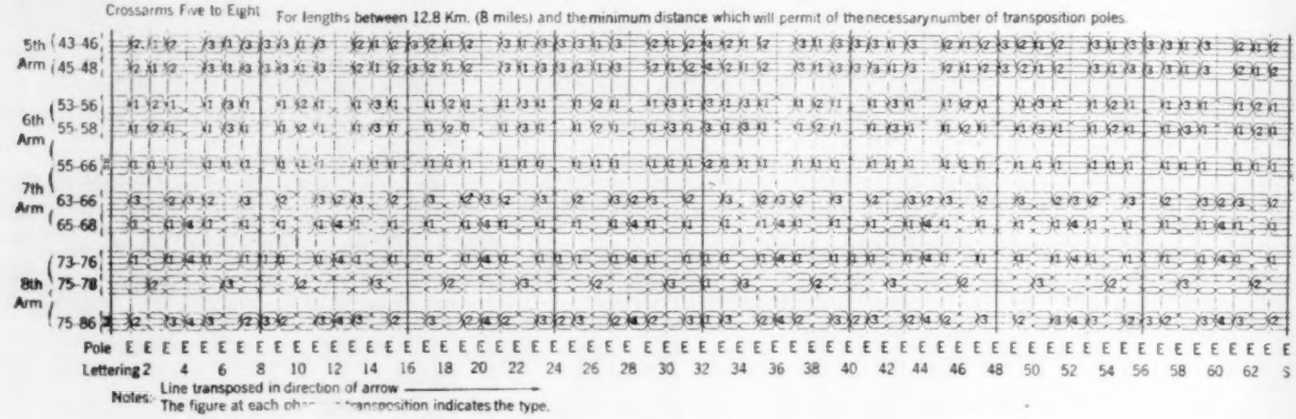

Crossarms Five to Eight
For lengths between 12.8 Km. (8 miles) and the minimum distance which will permit of the necessary number of transposition poles.
5th Arm
43-46
45-48
6th Arm
53-56
55-58
55-66
7th Arm
63-66
65-68
8th Arm
73-76
75-78
75-86
Pole
Lettering
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 S
Notes: Line transposed in direction of arrow
The figure at each ohe transposition indicates the type.

Fig. 9.—E Section—Transposition System for Phantomed Circuits on Exposed Telephone Lines—Arrangements for Horizontal Pole Pair Phantoms and Odd Vertical Phantoms.

The *E* section is designed for a maximum length of approxibately 12.8 km. It was found impossible to meet the electrical requirements for this case with the use of 32 transposition poles per section. It was possible, however, to design the *E* section so that in the first four crossarms the non-phantom circuits and the phantom circuits which are most commonly used require only 32 transposition poles, so that in some toll lines not exceeding four crossarms, the large number of transposition poles will not be necessary. For circuits on crossarms below the fourth and for some infrequently used phantomed circuits on the upper crossarms, 64 transposition poles are required.

The *E* section may be used for as short a length of line as supplies the required number of transposition poles. For distances less than 6.4 km., however, it is economical to use the *L* section. It has just half the transposition poles for the corresponding circuits.

When two or more *L* sections are used consecutively in the same loading section, junction transpositions should be installed at the *S* poles between them in order to reduce the induction between the telephone circuits. The junction transpositions are indicated in the drawings for as many as four consecutive *L* sections.

Use of E and L Sections on Exposed Lines.—The results obtained in meeting the special electrical requirements regarding balance to the inductive effects of outside circuits are indicated in the following table:

	E Section	*L Section*
1. Element of section in which each circuit is transposed at least once, *i. e.* balances to a parallel non-transposed disturbing circuit.	8th Section.	Quarter-Section.
2. Neutral points suitable for the location of transpositions in paralleling three-phase power circuits, separation of approximate centers of disturbing and disturbed groups of wires *more* than 6 meters.	8th Section points; *i. e.*, barrels having nominal length of 4.8 km. (3 miles) or 9.6 km. (6 miles) can be used. Five points dividing distance between any two 8th-section points into six equal parts, all five transpositions to be rotated in the same direction; *i. e.*, nominal .08 km. (0.5 mile) barrels can be used also.	Quarter-section points; *i. e.*, nominal 4.8 km. (3 mile) barrels can be used.
3. Neutral points suitable for the location of transpositions in paralleling metallic single-phase power circuits—separation as defined above *more* than 6 meters.	8th-section points. Three points dividing distance between any two 8th-section points into four equal parts.	Quarter-section points.
4. Neutral points suitable for the occurrence of discontinuities—separation as defined above *more* than 6 meters.	8th-section points.	Quarter-section points.
5. Neutral points suitable for the location of transpositions in disturbing power circuits or the occurrence of discontinuities in disturbing power or telegraph circuits—separation as defined above *less* than 6 meters.	Mid-section point.	Mid-section point.
6. Neutral points suitable for the occurrence of discontinuities in telephone circuits.	S-poles.	S-poles.

The results given in the table will be further illustrated in Figs. 16 and 17, which show permissible relative locations of the telepone transposition poles and of transpositions and discontinuities in the outside parallel circuits or changes in separation between the two classes of circuit.

It will be noted that the *E* section can be used to coordinate with transpositions in three-phase power circuits which create for the maximum length of *E* section 0.8 km. (½ mile), 4.8 km. (3 miles) or 9.6 km. (6 miles) in the power circuit. As it was considered very important to obtain the maximum practicable degree of flexibility in this respect, this matter was given very thorough study and a large amount of work was required to arrive at this result. It should be noted, moreover, that in the use of a 0.8-km. barrel, two barrels occupying a 1.6-km. section

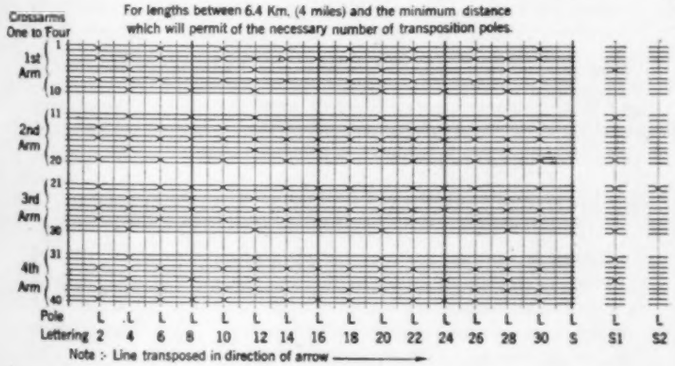

Crossarms One to Four
For lengths between 6.4 Km. (4 miles) and the minimum distance which will permit of the necessary number of transposition poles.
1st Arm
2nd Arm
3rd Arm
4th Arm
Pole
Lettering 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 S1 S2
Note :- Line transposed in direction of arrow

Fig. 10.—L Section—Transposition System for Non-Phantomed Circuits on Exposed Telephone Lines.

of the transposition system are required to obtain a balanced condition.

In the *L* section the requirements for the avoidance of excessive interference between the telephone circuits are more exacting than in the *E* section because the use of a smaller number of transposition poles makes available a correspondingly smaller number of typical arrangements of transpositions. It was found possible, however, to design this section so that it balances to a three-phase power line transposed at the quarter section points.

The exposed-line transposition system has been designed primarily for use on toll lines and not for use on joint lines with power distribution circuits. It is, however, somewhat better for this case than the other transposition systems in use.

When large inductive effects are experienced from circuits less than 20 ft. (6 m.) away from a side circuit, the variation in separation between the telephone circuit and the exposing circuits as the side circuits shifts from one pair of pin positions to another must be taken into consideration. The *E* section is not designed to give a high degree of balance under this condition for all circuits in each eighth-section, but does give balance to uniform outside induction effects for most circuits in each eighth-section and with one exception, for all circuits in each

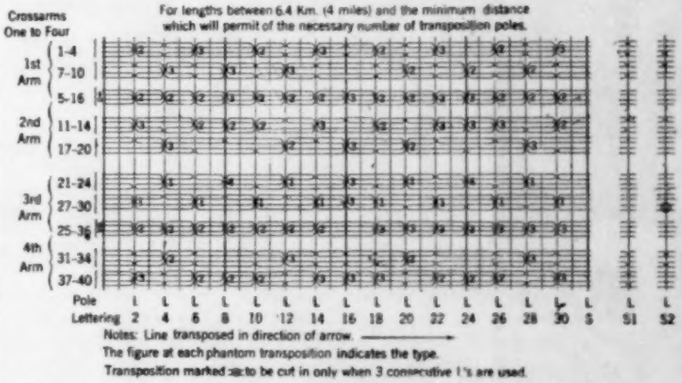

Crossarms One to Four
For lengths between 6.4 Km. (4 miles) and the minimum distance which will permit of the necessary number of transposition poles.
1st Arm 1-4 7-10 5-16
2nd Arm 11-14 17-20
3rd Arm 21-24 27-30 25-36
4th Arm 31-34 37-40
Pole
Lettering 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 S 51 52
Notes: Line transposed in direction of arrow.
The figure at each phantom transposition indicates the type.
Transposition marked ⊠ to be cut in only when 3 consecutive 1's are used.

Fig. 11.—L Section—Transposition System for Phantomed Circuit on Exposed Telephone Lines—Arrangements for Phantoming All Circuits.

half-section. Under similar conditions the *L* section gives a balance for most circuits in each quarter section and for all circuits in each half section.

It should be clearly pointed out that in the use of the telephone transposition sections to coordinate with transpositions in power circuits, it is important that the transpositions in the two lines

be coordinated both as regards relative length and as regards relative location of telephone transposition section and transpositions in the power circuits. The locations of the transpositions in either line must, therefore, be made with reference to the requirements of the other. It is frequently the case that the locations of the transpositions in the power circuit are to a large degree determined by the changes in separation and other characteristics of the parallel.

The *E* and the *L* section are both designed to give a high degree of balance of the inductive effects between the telephone

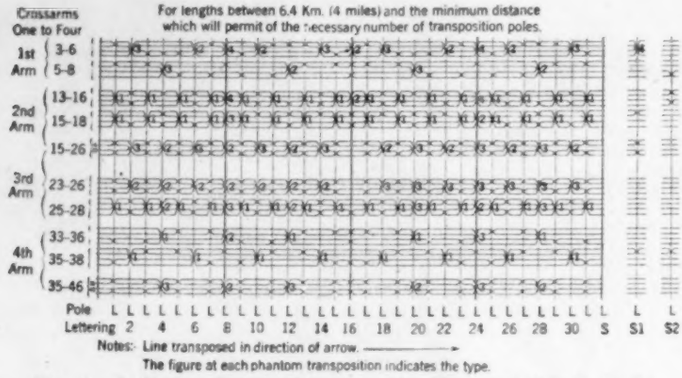

Crossarms One to Four
For lengths between 6.4 Km. (4 miles) and the minimum distance which will permit of the necessary number of transposition poles.
1st Arm 3-6 5-8
2nd Arm 13-16 15-18 15-26
3rd Arm 23-26 25-28
4th Arm 33-36 35-38 35-46
Pole
Lettering 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 S S1 S2
Notes:- Line transposed in direction of arrow.
The figure at each phantom transposition indicates the type.

Fig 12.—L Section—Transpostion System for Phantomed Circuits on Exposed Telephone Lines—Arrangements for Horizontal Pole Pair Phantoms and Odd Vertical Phantoms.

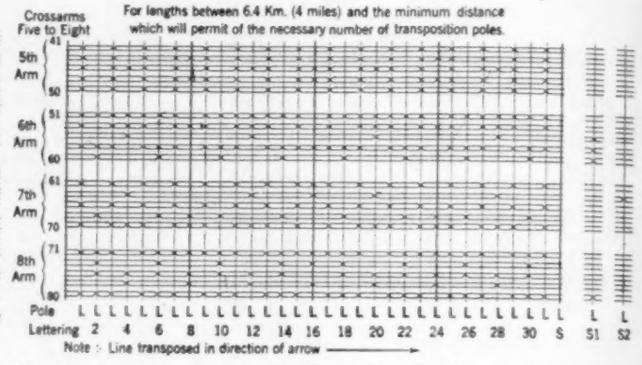

Crossarms Five to Eight
For lengths between 6.4 Km. (4 miles) and the minimum distance which will permit of the necessary number of transposition poles.
5th Arm 41 50
6th Arm 51 60
7th Arm 61 70
8th Arm 71 80
Pole
Lettering 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 S S1 S2
Note :- Line transposed in direction of arrow.

Fig. 13.—L Section—Transposition System for Non-Phantomed Circuits on Exposed Telephone Lines.

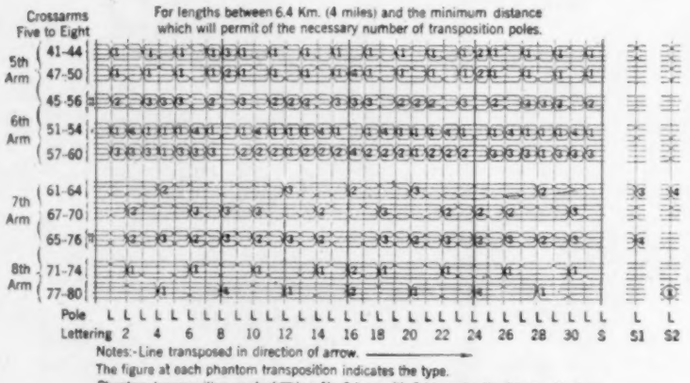

Crossarms Five to Eight
For lengths between 6.4 Km. (4 miles) and the minimum distance which will permit of the necessary number of transposition poles.
5th Arm 41-44 47-50 45-56
6th Arm 51-54 57-60
7th Arm 61-64 67-70 65-76
8th Arm 71-74 77-80
Pole
Lettering 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 S S1 S2
Notes:-Line transposed in direction of arrow.
The figure at each phantom transposition indicates the type.
Phantom transposition marked ⊠ is a No. 3 type with 3 L's and a No. 4 type with 4 L's.

Fig. 14.—L Section—Transposition System for Phantomed Circuits on Exposed Telephone Lines—Arrangements for Phantoming All Circuits.

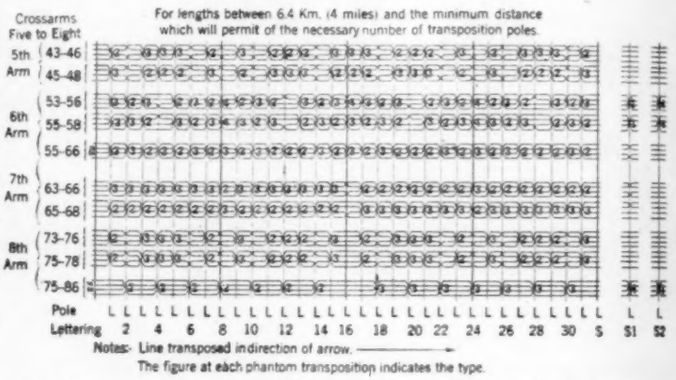

Crossarms Five to Eight
For lengths between 6.4 Km. (4 miles) and the minimum distance which will permit of the necessary number of transposition poles.
5th Arm 43-46 45-48
6th Arm 53-56 55-58 55-66
7th Arm 63-66 65-68
8th Arm 73-76 75-78 75-86
Pole
Lettering 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 S S1 S2
Notes:- Line transposed in direction of arrow.
The figure at each phantom transposition indicates the type.

Fig. 15.—L Section—Transposition System for Phantomed Circuits on Exposed Telephone Lines—Arrangements for Horizontal Pole Pair Phantoms and Odd Vertical Phantoms.

circuits. In using them, therefore, it is important that the transposition poles be spaced as accurately as practicable in order to avoid diminishing the effectiveness of the system in this respect because of irregularities.

The design work led to a large number of possible arrangements of approximately equal electrical efficiency. In choosing from these the most economical, account was taken both of the cost of transposing when stringing new circuits and of the cost of retransposing to the new system telephone lines now transposed according to other arrangements standard with the Bell Telephone Companies. Although a most careful study was made of economy it was necessary because of the special characteristics required in this system to allow in the final sections a cost of telephone transpositions 25 to 50 per cent greater than that of the section which is standard in the Bell Telephone System for use on non-exposed lines.

They Do It In England, Too

According to the *Yorkshire Weekly Post*, a telephone subscriber in Newark asked his operator to ring his bell in three minutes, and immediately hung up his receiver. At the appointed time the supervisor rang on the line, and the subscriber responded merely with "Thank you." Later he called again to thank the operator, and explained that he had been boiling eggs and wanted to time them.

CONCLUSION

The results obtained in the design of the *E* and *L* sections were possible only through a systematic study of the problem. The work directed particularly to the design of these two sections occupied about two man-years' time of the specially trained experts who carried out the work. The investigation has been so thorough that the conclusion seems warranted that the *E* section and the *L* section are substantially the best arrangement of transpositions which could be devised to meet the requirements established for them.

The work of many members of the engineering department of the American Telephone and Telegraph Company has contributed to the results. The theory of induction between telephone circuits and the special analytical methods of design have been developed in the department during a considerable number of years. Special mention should be made of the work of G. A. Campbell who, years ago, laid the foundations for the theory of induction between telephone circuits, and of A. G. Chapman and R. E. Leonard, who perfected the methdos of systematic search and carried out the design of the *E* and *L* sections.

(To be concluded.)

Prince Edward Island Direct Line

By the laying of a direct cable between Cape Tormentine, New Brunswick, and Cape Traverse, Prince Edward Island, an undertaking just completed, direct telephone connection between New Brunswick and the island towns has been established. Heretofore the only telephone service available was by way of Pictou, Nova Scotia, and cable thence across the Northumberland Strait. This was a roundabout route and not always satisfactory. The new line which has been put through by the New Brunswick and Prince Edward Island telephone companies acting conjointly, affords Moncton connection direct with Charlottetown, the charge being 65 cents for a 3-minute conversation.

Listening in on the Hun

The "Army and Navy News" Tells of the Work of the United States Signal Corps

WHEN the average man hears the Signal Corps mentioned he has a somewhat hazy idea of its work, and of how it is connected with the vast organization of the modern war machine. It is probable that it may bring before him the picture of a man in khaki up on a hill getting vigorous exercise by flinging his arms around or waving flags; or it may remind him of his nephew who went into the Signal Corps some time ago, whom he last heard of as being tired of going to school on the ground and lamenting that he had not yet gotten up into the air and learned to fly like a bird. Even to the man in the Army the Signal Corps is more or less an unknown quantity, as it seems to him to be the mecca that all his friends on the outside are anxious to reach, and where he would like to be himself, if he had only studied electricity instead of history and were as familiar with electrons as with economics.

The activities of the Signal Corps are so wide in scope and their development of so recent a date that this general vagueness is not to be wondered at. Until the time of the Civil War, armies and their units had been small enough to permit the commander to keep sufficiently in touch with his forces by runners and mounted messengers. During the Civil War, however, armies grew so large and unwieldy that their efficiency began to be impaired through lack of a perfect system of communication. It was seen that no matter how perfectly trained an army might be in its various activities, if it was unable to know the proper time to perform, its efficiency was imperiled. In fact, it was already realized that a perfect army is nothing more than a perfect soldier on a vast scale and, like that soldier, in order to be of any service or accomplish its aims, it must have a nerve and control system just as perfect as his.

The first step in improving the signal service was the use of the telegraph, which, at the time of the Civil War, had been commercially perfected. While some progress was made at that time in its use, it was not until the time of the Spanish-American War that the Signal Service of the Army was employed on anything like the scale of today. During that war the Signal Corps was an entirely mounted organization and was required not only to be as mobile as the cavalry, but was even required to anticipate the needs of the cavalry and immediately have stations, where all officers could transmit messages, open and working as soon as the cavalry came to a halt. Our Signal Corps had developed a system of communication for open warfare that was practically perfect; in fact, one which would have given any number of pointers to even the perfect German war machines.

At the opening of the present world war it was seen that the Signal Service as organized for open warfare would not be applicable to the different conditions required in trench warfare. As our entry into the war seemed so remote there was nothing done to actually change our methods, but at the same time the Signal Corps was making a study of the various means of communication in use by the different armies in Europe.

DUTIES OF SIGNAL CORPS

As soon as war was declared it was known at once just what the duties of the Signal Corps would be during the several months before the actual entry of our troops upon the firing line. It was known that the moment our force set foot on foreign soil to study and determine the method of warfare to be adopted, it would be necessary to keep this force in constant communication with the authorities at Washington. As soon as it was decided that our operations would be in France, the material and the personnel for laying trunk telephone and telegraph lines from the various seaports through the heart of France over to the theater of operations was at once assembled, and this personnel was among the first actual troops to be sent over. Today there is scarcely a city in the principal part of France, through which an American telephone line does not pass.

As soon as it was decided that we were to adopt the French methods of warfare we began to make a study of the French system of signaling. While we speak of having adopted the French system of warfare, this is only approximately true as concerns the work of the Signal Corps. The main problems were to see what different kinds of messages had to be transmitted, the various ways the French had of doing it, whether any of the English methods were an improvement, and, lastly, whether we could not work out a system combining all the merits of the others, at the same time omitting their defects. This has been done so far as possible and the United States Signal Corps now has a system of signaling as applied to trench and semi-open warfare which represents the most modern ideas of all the armies now at war, including even the German.

COMBINED SYSTEM A PRONOUNCED SUCCESS

The success of this system is attested not only by the way in which it works in trench warfare, but even more forcibly by the manner in which it has enabled perfect communication to be maintained in the first big offensive of the Americans.

The lines of information from the various Army headquarters are continued practically in the same manner as the main trunk lines that run through France in the service of supplies. Radio begins to play an important part in the game. However, it is within the division itself that the development of all means of communication takes place. Here every method of signal signaling that has ever stood up under the ordeal of battle plays its part. The whole area within ten miles of the front line is a maze of "Lines of Information." For convenience these lines may be divided into four great networks, any one of which may be depended upon as a complete and independent means of transmitting information.

The first and most complicated is the wire net. This begins at division headquarters and reaches its tentacles out toward the front in all directions. Its large central telephone exchanges located at intervals over the entire front, sometimes in half-demolished dwellings, sometimes in dug-outs 40 to 50 feet deep, are the busiest spots on the battlefield. Its lines must furnish communication for the artillery, machine guns, the infantry, the trench mortars, the balloons, the enginers, the field hospitals and all the other units that go to make up the war machine. In fact, the telephone system is much more elaborate and more complicated than in a young American city.

The problem of laying the wires under shell fire, and keeping them in repair at all times, is enormous. While the Field Signal Battalion of the Signal Corps is directly in charge of all systems of communication within the division, it is assisted by telephone men from all the other units, who work under it and carry out its ideas. The wires are often in the form of large buried lead cables, for whose installation it is necessary to employ highly specialized cable splicers, who carry on their work often with shrapnel raining around them. Lines radiate from these cables in smaller trunk lines, all of which have to be buried, but as these lines approach the front they are laid along the sides of the trenches the soldiers use.

It would be necessary to bury cable or wires 15 to 20 feet to make them at all immune from shell fire, and as it is almost impossible to accomplish this, it can be seen how great are the troubles which the signal men encounter in trying to locate and repair breaks, especially in rain and snow or on dark nights when the mere lighting of a match would be a welcome target for the enemy. All the wires have to be so carefully tagged and labeled that the telephone men can creep their way along a wire and merely by feeling these labels know exactly from what point the wire starts and where it terminates.

Another system which works independently of the wire system and which will interest the man who is inclined to wireless rather than wire work, is the radio net, which in itself furnishes complete lines of information throughout the area. In this net are employed radio instruments such as the average American radio man never dreamed of. Beginning at the front line are little radio sets with antenna so small that they can easily be concealed in dug-out. A little further back are trench radio sets whose transmitting range is larger than those in the dug-outs, but whose antenna are so small that they can be placed just off the ground and not be seen by the enemy or can even be placed in an unused communication trench.

THE MISSION OF THE RADIO

The radio serves a great mission in the artillery, where it is relied upon as the fundamental means of communication between the artillery and the airplanes which see and control the fire of its guns. Each shot is observed by one or more airplanes, which at once send with their radio sending sets the exact information of the result of the shot to the radio receiving set back by the gun. In this way it is possible to accurately adjust the fire of the guns on a target, which, without the use of the radio, would be impossible. It has recently been rendered possible for the airplane to carry on a radio conversation with the man behind the gun.

It can be seen how great is the advantage which radio communication has over the form of communication which requires the upkeep of wires, since with the radio there are no wires to be shot away and it requires a direct hit to put the instrument out of action. A new and interesting development is radio telegraphy through the ground instead of through the air. This has been extensively worked out and amplified by the Americans.

The third and most extensive network of information is the visual net. The inventive genius of the French has substituted for our wigwag and semaphore a small searchlight resembling an automobile headlight, but with a parabolic reflector which concentrates the rays and enables them to be directed upon one particular spot. This lamp is not only a complete system in itself but also parallels and duplicates all telephone lines, so that in case they become inoperative they can be replaced by the lamps. It would appear to be no safer to shoot a beam from an automobile headlight into the face of the enemy than it would to get up and wave a flag at him, but the Signal Corps experts seem to have overcome this difficulty, and the way in which it has been done illustrates, we are told, an interesting application of science to the field of signaling.

FIREWORKS FOR SIGNALING

The visual net makes elaborate use also of the old-fashioned fireworks, which have been in use in armies for years. Almost every infantryman as he goes over the top is equipped with one or more forms of fireworks whose proper or improper use may mean for him life or death. While fireworks are used principally by the infantry and artillery men, they are trained by soldiers of the Signal Corps and supplied with the right colors and selections. The number of signals which are readily distinguishable from each other under all conditions are limited, and as the enemy is constantly on the alert to pick up their meaning and duplicate them with signals of his own to confuse and mislead his opponent, it becomes necessary to change the entire fireworks code throughout the entire area. It is up to the Signal Corps to develop the code and to transmit the order to change. The airplanes following the infantry in an advance depend upon fireworks for their communication with the various units whose progress they are watching, and it is only when the front line troops light flares, which they place upon the ground, that the airplane at night is able to determine how far they have advanced and notify their own artillery in case it might be firing on them.

The messenger net, which is a modern adaptation of the runners and mounted messengers, is the fourth means of conveying information. This net serves primarily to transmit long orders and reports, but it is so extensively developed that it may be relied upon in an emergency also to provide complete communicaton throughout the area. The runners operate as of old, but instead of working on the ground they are winding their way through trenches and into dug-outs. A little further back mounted messengers are still employed, but they have almost wholly given way to motorcycle riders. The feats of the American motorcycle men in France are a mystery to the French. While the French possess motorcycles, they have never made the extensive use of them which the Americans have and consider them more of a toy than an instrument of warfare.

Where the French rely upon the mail for the transmission of orders between various larger headquarters, the Americans have established a motorcycle dispatch service with hours of departure and arrival as regular as train schedule in our own country.

STUDYING THE WEATHER.

The other activities of the Signal Corps offer opportunities for men interested in various branches of science. The meteorological department studies the atmosphere and compiles reports for commanders. These reports include information that affect the care of the troops, and the maintenance of supplies, and predictions as to whether the ground will be favorable for troop movement or whether the wind will be right for a gas attack.

The listening-in service is not the least interesting activity of the Signal Corps. There is always a readiness to pick up any information of the enemy that might be of use to us. Accordingly, the Signal Corps has numerous listening-in stations which, by means of devices recently perfected, it is able not only to intercept any enemy radio

message, but also to determine accurately the location of the radio instrument which transmits it. This information is, of course, at once furnished to the artillery, which proceeds to put that station out of business. Even German telephone wires have been made to divulge their secrets, though well within German territory, where it is impossible to tap their lines. All this is accomplished by one of the most ingenious instruments which has yet been produced. By means of it our Signal Corps man can sit in his dug-out on the front line with a receiver to hs ear and hear any telephone message within the enemy's territory, even though several thousand Huns, all jabbering their lingo, may intervene between him and the nearest point to the wires.

Engineers for Service in the Signal Corps

Announcement from the Office of the Chief Signal Officer of the U. S. Army.

AT the present moment there is a shortage of officer candidates having the required technical and personal qualifications available for Signal Corps Officer Training Schools. While ordinarily, officer candidates are taken from the enlisted personnel of the Signal Corps, a much smaller number having the necessary qualifications are available than are required. For this reason it is desired to secure by voluntary induction, for assignment to an Officers' Training School during the next two months, the services of a considerable number of electrical engineers who are available for full military duty, and who are between the ages of twenty years and nine months and forty-five years of age.

The United States Army is the only one of the large armies of the world which maintains a Signal Corps as a separate organization. The Signal Corps of the United States Army was established during the Civil War and has had a long and honorable record for service. At present its duties are two fold: first, it is charged with the duty of developing and producing signal apparatus for the mobile army, for the Air Service, and for the Coast Artillery Corps. This work covers all phases of communication and some of the most complicated electrical systems known are required.

Its second and principal duty is that of maintaining communication within the mobile army and along lines of communication. For this purpose two kinds of Signal troops are employed: First, the so-called Telegraph Battalions which install and operate telephone and telegraph lines in the rear of the army. Telegraph Battalions are attached to the army, army corps, and are also assigned to areas surrounding ports of debarkation, and to various zones in what is known as Service of Supply. Second, the Field Signal Battalions are organizations for service with combatant troops and are attached to the Division, as well as to the army and army corps.

The principal administrative unit in the army is known as the Division and consists of between 27,000 and 28,000 soldiers of all arms. Divisions are organized into Army Corps and Corps into Armies. To this unit there is attached one Field Signal Battalion consisting of three companies—the Radio Company, Wire Company and Outpost Company. The total strength of a Field Signal Battalion is fourteen officers and four hundred and sixty-seven enlisted men. The Radio Company maintains radio communication between the brigades, regiments and division headquarters and in general between other units of division. The Wire Company maintains wire lines of communication from regimental headquarters back through brigade headquarters to division headquarters. The Outpost Company maintains wire and ground telegraph communication from the regiment forward to the front line trenches. Artillery and Infantry also have certain signaling units and these together with the Field Signal Battalion, are under the supervision of the Division Signal Officer, who is responsible for all communication within the division.

The Field Signal Battalions attached to Corps and Army operate radio apparatus of special character and maintain long lines which are required from Division to Army Corps and from Army Corps to Army. From Corps and Army headquarters back to General Headquarters, supply depots, ports of debarkation, etc., the Telegraph Battalions maintain communication. In trench or stationary warfare, a Division is usually assigned to what is known as a "sector." This involves an area of perhaps five miles front and from five to fifteen miles in depth.

For the purpose of maintaining communication, the Signal Corps employes principally electrical appliances. The apparatus employed in general consists of the following: by Telegraph Battalions, all of the telephone and telegraph equipment employed by commercial operating companies including common and local battery telephone systems, loaded lines, phantom circuits, multiplex telegraph equipment and telegraph circuits superimposed on telephone circuits. High power radio stations are also employed and cable communication is frequently established and maintained by this unit. By Field Signal Battalions: telephone, telegraph and special devices for wire communication, damped and continuous wave apparatus for radio transmission and special devices making use of inductive effects and conduction through the earth for wireless communication. Much of the apparatus employed is energized from storage batteries and repair and charging plants for batteries are therefore necessary. In the Corps and Army Field Signal Battalions, amplifiers and special apparatus of great complexity and sensitivity are employed. Vacuum tube devices are now very largely used and have been brought to a perfection by the Signal Corps which was previously unthought of in commercial applications.

From the above it will be seen that the duties of the Signal Officer are many and varied. He may be assigned to the Outpost Company in which case his post is in the front line trenches and his duties consist in supervising the installation of communication devices using wire, radio and visual methods in maintaining effective communication from the front line trenches to the rear. It is obvious that in handling large numbers of troops such communication is vital to the success of any movement. If assigned to the Radio Company, he may be in charge of the installation of radio transmitting and receiving sets at regimental, brigade and divisional headquarters and will be responsible for the maintenance of radio communication between these units at all times. If assigned to the Wire Company he will be responsible for the laying and maintaining of telegraph lines and cables from divisional headquarters forward to regimental headquarters where the Outpost Company takes up the work. If assigned to Corps or Field Signal Battalions he may be charged with the duty of supervising the laying and maintenance of lines from the Corps and Army to the Division, or he may be given supervision of the operation of delicate listening-in and intercepting devices. If attached to a Telegraph Battalion he may be employed as telephone outside plant engineers are in commercial life in the construction of long telephone and telegraph lines of communication. If his qualifications are of very special character, he may be assigned in connection with development, design, and manufacture of radio or of telegraph

Morse Telegraphers Wanted

The War Department, through Signal Corps channels, made public, October 23, a special cablegram from General Pershing calling for immediate shipment to France of 750 expert or "bonus" Morse telegraphers. Men skilled in Morse telegraphy, between the ages of 18 and 55, inclusive, should apply immediately by letter, wire or in person to the Department Signal Officer, 230 East Ohio street, Chicago, or to the Chief Signal Officer, War Department, Washington, D. C.

Significance of the desperate need for these men is given in that the physical standard will be lowered in all cases where men have physical disqualifications, but who are able to perform the work before them.

"Men between the ages mentioned," says the official announcement, "who are qualified, are badly needed at the front, and unusual opportunities are offered them for early service."

Added to these unusual concessions for service, is another feature with respect to getting overseas immediately. "Bonus and expert telegraphers who enter the service will not be kept in training camps except for a sufficient time to outfit them with clothing and the necessary equipment."

Requisitions for the above-mentioned number of Morse telegraphers have been received from General Pershing, to be sent to France between now and June 30, 1919. One hundred and fifty qualified men are to be sent abroad immediately, and the balance will go overseas at the rate of about one hundred a month.

and telephone apparatus. Wherever he may be it is his duty to supervise the instruction of the enlisted personnel under his charge. The Signal Officer, unless assigned to staff duty, is in command of troops and as such is responsible for their welfare and for their instruction.

In view of the technical nature of the duties of Signal technically. At the completion of this period, those who have shown by their record that they are officer material will either be commissioned in the grade of 2nd Lieutenant at once or assigned to a course of further military instruction as officer candidates at a Signal Corps Camp. Opportunities for further promotion are excellent, especially for men of balance and judgment, who have had sufficient experience to be capable of taking responsibility. Those who do not qualify as officer candidates will remain in the army in an enlisted grade and will be Officers, the most suitable candidates for commission as such are electrical engineers who have had experience in power or communication work. Such men have a good knowledge of electrical matters including the fundamentals of alternating and direct currents and have little difficulty in picking up rapidly the principles involved in the construction and operation of telephone, telegraph and radio systems.

It is desired by the Signal Corps to receive applications for service from men who are qualified as outlined in the preceding paragraph. Such men will be individually inducted into the army and assigned as enlisted men to an Officer Candidates' Training School, which is now being maintained by the Signal Corps. This plan of entering the service as enlisted men is now universally followed in the army. Such men will be assigned to a course of technical instruction for Officer Candidates lasting thirteen weeks, during which time they will receive such instruction and review as is needed to qualify them assigned to an organization of the Signal Corps and given opportunity to develop the qualities in which they are lacking and to qualify for a further assignment to an Officers' School.

A large number of engineers will doubtless remember that a year ago a campaign was made for engineers who were to qualify for commissions directly in the Signal Corps without having to go through a course of instruction. This method of securing officer personnel was necessary in view of the very large number of officers suddenly required. It is not followed at the present time because it is obviously an injustice to the enlisted personnel of the army, who should be given every opportunity to qualify in competition for commission and because sufficient time is now available in which to train and select officer personnel.

Promotions in the army are now made by selection rather than by seniority and the well qualified engineer need have no fear that his claims to promotion will not be recognized because some younger and less competent man outranks him in point of length of service.

Electrical engineers who desire active service in the army with opportunity to secure commission should fill out application for service blank furnished, setting forth completely their military status, together with their experience and training. On being accepted for service, they will be inducted into the army in the grade of private and sent to an Officers' Training School with such prospects as have been outlined above.

Application forms may be obtained by addressing: Training Section, Office of Chief Signal Officer, War Department, Washington, D. C.

Interstate Commission Asserts Itself

The Interstate Commerce Commission October 24 asserted its authority to alter railroad freight rates initiated by Director-General McAdoo, even without affirmative showing that they are wrong, and announced that the assumption that such rates are presumed to be right and just is incorrect.

The pronouncement was in a decision written by Commissioner McChord, finding for the complainants in the case of the Willamette Valley Lumbermen's Association against the Southern Pacific and others. The opinion declares:

"It is inconceivable, in our opinion, that congress did a vain thing in conferring on this commission power to determine whether or not rates initiated by the director-general are just and reasonable. The same force and effect must be given to that part of the law as to its other provisions."

"Telephone Troops" Lead Attack

"The advance was led, not by tanks and infantry, but by soldiers of the telephone."

Those words in the report of the colonel of an American regiment paid merited tribute to a class of fighting men often forgotten—the ears and eyes of the advancing columns.

The story had just been revealed of the heroic part a Milwaukee sergeant and his squad of seven privates, of the telephone signal corps, played as their regiment fought its way across the Ourcq and up the Vesle. They were of "Le Brigade Terrible," the name the French gave to the brigade that captured Fismes in August.

During five memorable days and nights they laid forty kilometers of telephone wires and stubbornly kept them mended while shrapnel tore at their work; throughout they were rainsoaked, for three days and nights they were without sleep, and only once they had food, some bread and lukewarm coffee.

The decision to push forward came after midnight. The colonel wanted instant reports from the battalion that was going on to the crest of the hill. He was doubtful if a wire could be laid.

Sergeant George C. Burr of Milwaukee and seven men volunteered to lay that wire. At 3:45 o'clock in the morning they stole forward, single file, carrying two telephones and eight coils of wire.

At 4:20 a call came to regimental headquarters. The master signal electrician jumped to take it.

"Sergeant Burr speaking," came the calm voice over the wire.

What! Had he actually reached the crest of the hill? Yes, just as far as the wire would reach. Where were they? Lying on their bellies in the mud. Where was Fritz? Oh, a scant 100 yards away.

"A lot of machine guns popping," said Sergeant Burr. It turned out later there were eighteen nests of them almost at his elbow.

The report in, Burr was ordered to station one man at the telephone with instructions to call up regimental headquarters every five minutes and then to take the other six men and make for the nearest shelter. Five minutes later the telephone buzzed.

"Sergeant Burr speaking." The voice was tranquil in the midst of the cannonade.

"I thought I told you to take to cover," exclaimed the master electrician. What are you doing there?"

"I'll be d—d, sir," said Sergeant Burr, "If I'll ask any man to stay in such a place as this. No other change, sir."

So, defiantly valorous, it was Sergeant Burr who made the reports every five minutes in order that regimental headquarters might know the wire was still open. He stuck by his post till the oncoming battalion was abreast of him. Then, a little after seven o'clock he left the telephone at the tree—because it was perilous no longer, and also because he wanted to "go forward with the bunch."

Sergeant Burr wasn't alone, either. When he ordered his men to shelter in a ditch after the telephone had been set up, Corporal Donald Palmer and Private Edwin Pelky refused to go. They stuck by through the thick of it.

The bravery of telephone men under fire is frequently commented on in the press, and the foregoing instance is but one of many.

BY HERBERT S. HOUSTON

Member of the Chamber of Commerce of the U. S. A. on Economic Results of the War

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Chapter XV—The Sword as Final Arbiter

THERE were few illusions among the two hundred and fifty thoughtful people who gathered from nearly all parts of the United States, at Independence Hall in Philadelphia in June, 1915, to consider proposals and plans for lessening the dangers of war. For ten months the great war, steadily becoming greater, had been in progress. By general agreement, even more impressive because scarcely spoken, being in the minds of all present, the four proposals formulated for the programme of the League to Enforce Peace, there organized, were for international adoption when the war was over. That agreement was interpretative of the sane and practical spirit which pervaded this short but historic conference. Not only was there no illusion about stopping the war already on, there was no illusion in regard to preventing future wars by the pacifist formula of optional arbitration or sanctionless courts. Of course the doctrine of non-resistance, even in a city whose hall of government bore the bronze effigy of William Penn, was not so much as mentioned. Instead of that, this great peace conference drew the sword, and in a noble preamble to its platform pointed to it as the final arbiter in any league of nations that might hope to supplant war by law in settling disputes between governments.

The founder of the University of Virginia, Thomas Jefferson, when he presented the Declaration of Independence in the same Hall, one hundred and thirty-nine years before, had concluded it with the martial words of ultimate and complete sacrifice: "To this declaration we pledge our lives, our fortunes and our sacred honor." The President of Harvard University, A. Lawrence Lowell, placed in the forefront of the platform of the League to Enforce Peace, reported by the Committee of which he was the Chairman, words that implied the same supreme pledge: "Throughout five thousand years of recorded history peace, here and there established, has been kept, and its area has been widened, in one way only. Individuals have combined their efforts to suppress violence in the local community. Communities have co-operated to maintain the authoritative state and to preserve peace within its borders. States have formed leagues or confederations or have otherwise co-operated to establish peace among themselves. Always peace has been made and kept, when made and kept at all, by the superior power of superior numbers acting in unity for the common good. Mindful of this teaching of experience, we believe and solemnly urge that the time has come to devise and to create a working union of sovereign nations to establish peace among themselves and to guarantee it by all known and available sanctions at their command, to the end that civilization may be conserved, and the progress of mankind in comfort, enlightenment and happiness may continue."

Then followed these four short proposals:

First: All justiciable questions arising between the signatory powers, not settled by negotiation, shall, subject to the limitations of treaties, be submitted to a judicial tribunal for hearing and judgment, both upon the merits and upon any issue as to its jurisdiction of the question.

Second: All other questions arising between the signatories and not settled by negotiation, shall be submitted to a council of conciliation for hearing, consideration and recommendation.

Third: The signatory powers shall jointly use forthwith both their economic and military forces against any one of their number that goes to war, or commits acts of hostility, against another of the signatories before any question arising shall be submitted as provided in the foregoing.

Fourth: Conferences between the signatory powers shall be held from time to time to formulate and codify rules of international law, which, unless some signatory shall signify its dissent within a stated period, shall thereafter govern in the decisions of the judicial tribunal mentioned in Article One.

The distinguishing thing in these proposals, of course, and the thing which definitely separates them from the proposals of other peace organizations is the placing of force behind a world court, compelling it to be used. And why not? Surely the world, after the devastation and destruction of the present war, will come to the place where peace will seem so much to be desired that it is even worth fighting for. Many will say, this is war itself, the very thing we seek to prevent. But let it be stated in rejoinder with overwhelming emphasis, that such a war, if it should be required as a last resort, would be war to enforce peace. It would be war to establish the integrity and authority of world courts that the nations had joined in setting up and had joined in agreeing to use. In a word such a war would be simply the use of power to enforce the due processes of international law and justice. If a court set up by the people is flouted, the State, through its constitutional officers and, if necessary, through its armed forces, asserts the sovereign power of the people and commands and compels respect for the court. That is not war—it is the State maintaining peace. So it is with the use of armed force to compel a recalcitrant nation to take its international differences to a court instead of to a battlefield. That would not be war but the exercise of military power to enforce peace. And it would frequently happen that the use of the great power of international commerce, applied as economic pressure, would be sufficient to sober a nation and bring it to the World Court, without resort to military force.

Chapter XVI—Business the Protector of Democracy

IN all countries the development of commerce has been accompanied by a gradual but inevitable development of democracy. So gradual is this that the deduction is sound that between the two there is a relation of effect and cause. The reason for this is not obscure for it inheres in the very nature of both commerce and democracy. They both stand for co-operation in human relationships. As commerce grew it became a constantly increasing source of revenue to governments and secured a constantly increasing number of rights and privileges. Many of these came after long struggle but they always bore witness to the growing power of commerce, which won them. In time, especially in English-speaking countries, commerce became included in the encompassing word business, which stood for the whole range and field of commercial enterprise. Today business is practically the organized life of the world. It includes in every country countless individual concerns and corporations. These are often grouped in associations representing their respective branches of business. The whole amazing network of relations and interrelations is the result of co-operation and co-operation is the essential principle of applied democracy.

One of the most significant consequences of the commercial organization of the modern world has been the stimulus it has given to the democratic idea. When men meet on a plane of equality in business and develop both the philosophy and the practice of democracy it becomes inevitable that their relations with their governments should work surely toward democratic ideals and principles. And that fact explains much of the democratic progress that has been going on all over the world. Even in autocratic nations where government has continued to be largely in control of the hereditary nobility there has grown up a great commercial class, grounded in the democratic idea of individual worth, opportunity and initiative and from this class the government service in every country has been constantly recruited. As a result there has been a steady democratic infusion from business that has profoundly affected political thought everywhere, because men who have climbed up from the ranks seldom lose "the common touch," however influential in government affairs they may become, and whatever the titles they may be invested with. It is these men who are a material part of the leaven of constructive liberalism in every country against irresponsible autocracy on one hand and irresponsible democracy, representing the rule of the mob, on the other. In the international reconstruction toward which the world is fast moving they may be expected to bear an important part. And it is a cheering fact to recall at such a time that their training and their views are not only largely democratic but, to a considerable degree, international. In business within, they have been schooled in the democratic practice of equality; in business without, in the field of world trade, they have learned something of international forces and relationships.

During the war a striking illustration of the stabilizing influence in international affairs of business men has been offered in the work of the International Sugar Committee. This committee was composed of three members from the United States, Mr. Earl D. Babst, president of the American Sugar Refining Company; Mr. George M. Ralph, head of the Sugar Division of the Food Administration, and Mr. William A. Jamison of Arbuckle Brothers, and there were two members from the Allied Governments, Sir Joseph White-Todd and Mr. J. Ramsay Drake, both of England. These five men in the fall and winter of 1917-18, by co-operative buying and control of distribution, succeeded in overcoming an almost panic condition, due to threatened famine, stabilized conditions that bordered on demoralization and established an equitable balance between the rights of producers and consumers in all of the Allied countries. This result in a single industry is indicative of what business men may accomplish in the new international conditions that will come with a league of nations.

Another illustration that is even more important is that of the pooling of all shipping interests among the Entente Allies. An International Shipping Board was formed with Mr. P. A. S. Franklin, president of the International Mercantile Marine, as chairman, and Mr. H. H. Raymond, the shipping controller of the Food Administration, as the American members, and with Sir Connop Guthrie as the English member. And this board took under control the unification and direction of all the shipping services of the Allies. So conservative a newspaper as the New York *Times*, in commenting on this radical departure, said: "This war is different from other wars in that its results will be economic rather than territorial or dynastic. There will be territorial readjustments with peace. There have been dynastic and political revolutions, and there will be more. It was not intended to minimise them when it was suggested that they were rivalled by the passage of the world from a past of economic nationalism into a future of economic internationalism."

The truth is the league of nations that has been fighting the war for democracy has been learning how to apply economic internationalism as a force to maintain peace when a greater league of nations is formed.

Chapter XVII—The Voice of the People

DEMOCRACY in its advance has kept step with the progress of knowledge. Not until the war was recognized as a crucial struggle for the preservation of individual liberty did it set up the fundamental issue that united the democratic nations of the Old and New Worlds. The full support of free and independent men came only through a realization and understanding of the cause for which they were called to sacrifice and die. The United States did not enter the war until its people had given unmistakable proof of their conviction and will.

How was this proof presented? Through the great democratic organ of public opinion, the press. The history of those anxious days of our neutrality shows the touchstone was applied to the sovereign force of public opinion. The successive public addresses of President Wilson prior to April 6, 1917, trace the emergence of the United States from its traditional policy of national isolation. Editorial comment in more than 2,000 daily newspapers assured the President that the people were with him at each step toward the final call to arms. How carefully the head of the nation studied the popular effect of these messages was demonstrated by the fact that summaries of editorial opinion embracing extracts from several hundred leading newspapers in every part of the country were laid before him within twenty-four hours after the publication of an address or message. These summaries, made by the Associated Press, not only kept the President informed of the state of the public mind but mobilized opinion throughout the nation.

Having agreed to the fight, after free and open discussion through the press, the people of the United States utilized the same agency in mobilizing for war. The campaigns to conserve our resources and to finance the war owed their success principally to the support of the newspapers. Printers' ink accomplished for America what was possible in Germany and Austria only through imperial decree and the fear of armed authority.

Through their newspapers the people of the United States

became familiar with the principle that the only kind of peace worth fighting for is a permanent peace, based upon international covenants. The ideal of international reconstruction was launched by the League to Enforce Peace. Before it attained concrete form in the platform adopted at Philadelphia, in June, 1915, the conception had gained little attention outside the circle of political economists and advanced political thinkers. A nation trained for generations to cherish the tradition of isolation and non-interference with European affairs might well have regarded the proposal as heresy. As a thesis it appealed to both mind and imagination; from the outset it had the support of men of international reputation; but these advantages alone could not have intrenched the idea as firmly as it stands today without the aid of the press.

A careful survey of editorial opinion at the time this book is written indicates that, while there are differences of opinion as to method, the general plan of a league of nations is favored by the newspapers in overwhelming majority.

The attitude of the press is significant because upon this great clearing house of public opinion will rest much of the responsibility for the success of the plan once it is adopted. All the nations are gaining greater respect for the views of their neighbors. The telegraph, the submarine cable and the telephone rank with the railroad, the steamship, the automobile and the airplane as agencies drawing mankind into one great family. If a citizen with a quarrel on his hands knew that his neighbors sided with his opponent, he might think twice before venturing to gain his ends by force. In the same way a nation, however aggressive and ruthless, would hesitate to attack another if it believed the other nations of the world would not support its quarrel.

Here is where the machinery of an international court and forced arbitration would serve to block an outbreak of hostilities until the questions at issue could be laid before an international jury. Since the proceedings of such a tribunal would be public, long before the court had handed down its decision the issue would have gained a popular verdict. The press of the world would act as unofficial advocates and the case would be tried first at the bar of public opinion.

If the quarrel reached the stage where the united nations decided to use the trade boycott against an offending member of the league, either with or without military force, such a boycott could not be successful unless it were backed by the people.

In fact, public sentiment alone, without official action, might be strong enough to exert effective economic pressure if mobilized and directed by the united efforts of the press. This is the idea back of the 1918 referendum of the United States Chamber of Commerce. A boycott such as this plan proposes would be purely popular and without government sanction.

Under the domination of an autocratic government a national press can become a powerful instrument to advance the interests of selfish despotism. But the free press of America, uncensored and responsible only to the people upon whom it depends for support, has proved itself one of the most effective weapons in the arsenal of democracy.

Chapter XVIII—The New Day After the War

THE great war is in its fourth devastating year as this book is published. What will follow it in the way of world reorganization no one can clearly foresee. But that great changes are impending is no longer looked upon as prophecy, for their necessity and inevitability are everywhere understood and conceded.

There are three forms which these changes could conceivably take.

1. Increased imperialism in the world—by that is meant increased militarism and increased territorial empire under the control or sovereignty of a single nation.

This change seems to be impossible, for to bring it about would require complete German victory. Unless that is achieved imperialism cannot have a place in the world any larger after the war than it had before the war, for the allied nations have made their fight for the underlying principles of democracy. Their governments have stated in the most definite form that they were agreed in favor of equality among nations, small and great, in favor of each country determining its own government and in favor of a policy of no annexations.

If these principles should suffer defeat in this war it can be but a temporary defeat, for these principles are eternal and must ultimately prevail. And they must prevail in Germany and Austria and Turkey, quite as much as in France, England, America and throughout the world. To hold to any other view is to deny progress and to shut out the light of history.

A change that would represent the farthest possible extreme from imperialism would be:

2. Radicalism in the extreme form it has taken in Russia under the rule of the Bolsheviki or in the form represented by the British Labor Party.

This is a result that is not impossible in the sense that the imperialistic result appears to be, but it is highly improbable. Representative democracy, before the war came, had gained the day in England, in France, Italy and America and it will not surrender all it has won, in a thousand years of steady progress, to the red flag of socialistic revolution. But this is not said in denial of the profound effect which the Russian revolution is having and will continue to have on the democracy of every country in the world. The full measure of that effect is not apparent—will not be for generations—but among events that have been influenced, to some degree at least, are the great strikes in Germany and Austria in favor of a democratic peace and the formation of an independent Labor Party in England, with so strong a demand for a statement of war aims that Lloyd George was compelled to heed it. About the time Lloyd George spoke, President Wilson gave to the world a statement of America's war aims and these were at once taken up by English Labor and claimed as their own. And as these declarations were being made, Trotzky, the Russian foreign minister in the Bolsheviki Government, published a book, "The Bolsheviki and World Peace." In it he gave this formula for peace—"The peace of the peoples themselves and not the reconciliation of the diplomats. No contributions. The right of every nation to self-determination. The United States of Europe—without monarchies, without standing armies, without ruling feudal castes, without secret diplomacy."

This was written, evidently, a short time before Lenine and Trotzky came to power and, in substance, it was the formula presented by the Russian delegates at the council table at Brest-Litovsk, although they failed utterly in securing its adoption. Of course the Allies have the deep conviction that Russia in making a separate peace with Germany was guilty of an act of the basest treachery. It is clear that it released great armies for another drive toward Paris, and was followed by a new drive for conquests in Russia. But it released, also, great armies of radical ideas that have made an insidious and powerful attack on the morale of the German people. Which groups of armies, those operating outside Germany or those operating inside, would do the greater destruction was not determined when this was written. But they were engaged in accomplishing results that were violently contradictory.

And in Russia there has been some reaction from the radical influences that have been in full swing. To what degree the

Bolsheviki have been affected by more moderate democratic influences is not clear, but it can be safely believed that they have been much affected and that, ultimately, either their views will be influenced from without, in as large measure as they have themselves influenced the views of other democracies, or the Bolsheviki will be supplanted by those representing more conservative ideas. This is but stating the fact that as a rule human reactions, in time, establish an equilibrium. No gift of propehcy, therefore, is needed to foresee that the world, after the war, will not go all the way to the international socialism that is accepted and proclaimed by the Bolsheviki.

The able report on reconstruction by the subcommittee of the British Labor Party presents the farthest swing which the pendulum of radical liberalism can be expected to make. As the proposals in this report will unquestionably be advocated for adoption by an important section of the British Parliament—it is not impossible that the next general election in England will show that that section represents a majority—they must claim at once the serious attention of all thinking people. Count Okuma is credited, in this report, with having expressed the view, from his vantage point of perspective in Japan, that the present conflict would result in the death of European civilization. "We of the Labor Party can so far agree in this estimate," says the report, "as to recognize in the present world catastrophe, if not the death, in Europe, of civilization itself, at any rate the culmination and collapse of a distinctive industrial civilization, which the workers will not seek to reconstruct. At such times of crisis it is easier to slip into ruin than to progress into higher forms of organization. That is the problem as it presents itself to the Labor Party.

"What this war is consuming is not merely the security, the homes, the livelihood and the lives of millions of innocent families, and an enormous proportion of all the accumulated wealth of the world, but also the very basis of the peculiar social order in which it has arisen. The individualist system of capitalist production, based on the private ownership and competitive administration of land and capital, with its reckless 'profiteering' and wage-slavery, we shall do our utmost to see that it is buried with the millions whom it has done to death. If we in Britain are to escape from the decay of civilization itself, which the Japanese statesman foresees, we must ensure that what is presently to be built up is a new social order, based not on fighting but on fraternity—not on the competitive struggle for the means of bare life, but on a deliberately planned co-operation in production and distribution for the benefit of all who participate by hand or by brain—not on the utmost possible inequality of riches, but on a systematic approach towards a healthy equality of material circumstances for every person born into the world—not on an enforced dominion over subject nations, subject races, subject colonies, subject classes, or a subject sex, but, in industry as well as in government, on that equal freedom, that general consciousness of consent, and that widest possible participation in power, both economic and political, which is characteristic of democracy. We do not, of course, pretend that it is possible even after the drastic clearing away that is now going on, to build society anew in a year or two of feverish reconstruction. What the Labor Party intends to satisfy itself about is that each brick that it helps to lay shall go to erect the structure that it intends, and no other.

The Telephone as a Conscript

Like most other great inventions designed to further the arts of peace the telephone has been drafted as a weapon of war. Even in the early days of the present struggle the English military-telephone system was so complete that General French was able to direct the field operations of the British Army in Flanders by telephone from his home in London. Ever so many instances have occurred in the present war where local defeats and serious losses of life have resulted from the destruction of telephone junction boxes.

When the indomitable tank goes crawling across No Man's Land on its mission of destruction a soldier lying on top or standing within the monster talks through his telephone over a wire that is unwound as this moving fort goes forward. Thus are the operations of these machines intelligently directed. As the captive balloon ascends men on the ground pay out a telephone wire, which connects the observer in the basket with field headquarters. When the artillery train goes forward and takes up its position near the Front one of the cars is a telephone central station, and the messages hurled in over these wires are responsible for directing the fire of the big howitzers on other cars.

But this is not all, for the telephone has been adapted to stranger uses. The army surgeon now finds that by connecting one terminal of a telephone with a moistened electrode applied to the patient's skin, and the other terminal to a metallic probe, it is possible to discover a bullet located in the man's body. —*Saturday Evening Post.*

"The four pillars of the house that we propose to erect, resting upon the common foundation of the democratic control of society in all its activities, may be termed:

"(a) The Universal Enforcement of the National Minimum Wage;

"(b) The Democratic Control of Industry;

"(c) The Revolution in National Finance; and

"(d) The Surplus Wealth for the Common Good."

After presenting arguments in favor of these proposals the report gives this unqualified endorsement to the league of nations:

"We stand for the immediate establishment, actually as a part of the treaty of peace with which the present war will end, of a universal league or society of nations, a supernational authority, with an international high court to try all justiciable issues between nations; an international legislature to enact such common laws as can be mutually agreed upon, and an international council of mediation to endeavor to settle without ultimate conflict even those disputes which are not justiciable. We would have all the nations of the world most solemnly undertake and promise to make common cause against any one of them that broke away from this fundamental agreement. The world has suffered too much from war for the Labor Party to have any other policy than that of lasting peace."

(To be continued.)

Telephone Patents Recently Issued

A Brief Digest of those Current Specifications Most Interesting to Telephone Men

BY DAVID S. HULFISH

PATENT No. 1,265,225. Semi-Automatic System. Issued to T. G. Martin, assignor to Automatic Electric Company, Chicago, Ill. When the long distance operator answers a call coming from the automatic switchboard, an audible signal is received which indicates the class of service to which the calling line belongs, whether paystation, partyline, restricted local service or unlimited long distance service, etc.

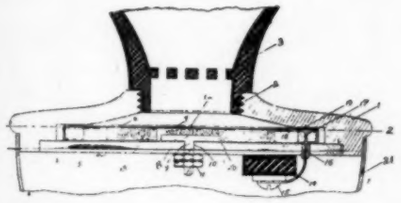
1,265,228. Trunking System. Issued to E. A. Mellinger, assignor to Automatic Electric Company, Chicago, Ill. In an automatic exchange, when all trunks of a group are busy, the selector is prevented from searching until a trunk becomes idle and may be connected with.

1,265,398. Automatic Switchboard. Issued to A. E. Stevens, Providence, R. I. For small private automatic exchanges; the switches have one movement of selection, and are arranged like shelves, with the multiple tags in a single row and connected with bare wires for the multiple wiring. The limit of capacity is thirty-three telephones.

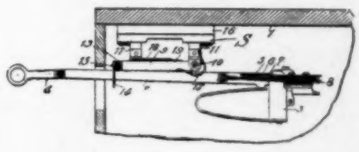
1,265,716. Meter System. Issued to G. A. Yanochowski, assignor to Automatic Electric Company, Chicago, Ill. In an automatic exchange, the meter of the calling line, located at the central office, is operated by a circuit controlled by the answering line and passing to the calling line over the private wire of the connection.

1,266,530. Transmitter. Issued to John Z. Miller, Erie, Pa. The rubber band, usually snapped over the edge of the transmitter diaphragm, covers a mounting ring also and holds the diaphragm to the mounting ring.

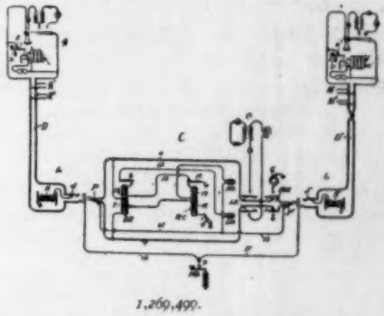
1,266,623. Automatic Ringing System. Issued to R. L. Quass, assignor to Western Electric Company, Inc., New York, N. Y. In an automatic exchange, the calling party may operate, after the answering party has answered and has left his telephone, to cause the central office switch to set up the ringing condition again to recall the answering party without the usual process of releasing and calling again.



1,266,530.



1,269,425.



1,269,499.

1,267,031. Trunk Circuit. Issued to B. D. Willis, assignor to Automatic Electric Company, Chicago, Ill. Earth potentials sometimes interfere with the operation of signals between exchanges over earth-return circuits; this invention provides a separate path for battery currents and battery-free earth currents, taking advantage of a feature which formerly was an annoyance.

1,267,097. Automatic System. Issued to T. G. Martin, assignor to Automatic Electric Company, Chicago, Ill. (Application filed March 26, 1907.) The calling telephone operates the selective switches to select the desired number, then connecting with the first idle line if the called number is a branch exchange or equivalent, but it is reserved to the answering line to apply talking current for the transmitter of the calling line. Under the original Strowger circuits, the signaling for the desired number was not done by a loop circuit suitable for speech transmission, but by earth circuits.

1,267,113. Party-Line System. Issued to W. T. Powell, assignor to Automatic Electric Company, Chicago, Ill. In the case of an automatic telephone exchange having party lines, circuits are provided such that calls for party-line stations which exist upon the party line are connected in the usual manner, but when a call is made to a party line and for a station which does not exist upon that line, by reason of discontinuance of service for instance, that call is not completed to the party line, but is transferred to an information operator for attention.

1,267,131. Signaling System for Automatic Exchanges. Issued to A. B. Smith, assignor to Automatic Electric Company, Chicago, Ill. A phantom circuit for operator's use is placed upon the automatic trunks between exchanges, and the transmission of signals for automatic operation of the trunk line is so arranged as not to interfere with the operation of the phantom circuit.

1,267,433. Automatic Switch. Issued to J. L. McQuarrie, assignor to Western Electric Company, Inc., New York, N. Y. The switch has two sets of brushes and operates to connect together two sets of bank contacts, first operating to pick up a calling line and then operating to select a set of contacts with which it connects the calling line first picked up.

1,267,743. Selecting Switch Control. Issued to W. L. Campbell, assignor to Automatic Electric Company, Chicago, Ill. (Application filed October 7, 1907.) Where a group of trunks lead from a central exchange to a private branch exchange, or from a branch exchange to the central office, in a switch which also has other lines individual to subscriber's telephones, the switch is arranged to search over the lines which are grouped and to operate for direct connection and busy-tone on individual lines.

1,268,068. Trunk Signal System. Issued to B. D. Willis, assignor to Automatic Electric Company, Chicago, Ill. (Application filed January 18, 1910.) In a trunk between exchanges, a relay responsive to ringing current operates another relay which opens the conductors of the trunk plug, so that one operator may ring another over the trunk cricuit, yet the relays operate to prevent the ringing current from passing to the line to ring the telephone.

1,268,069. Transmitter Feed Circuit. Issued to E. D. Fales, assignor to Automatic Electric Company, Chicago, Ill. (Application filed November 6, 1906.) The side switch of the Strowger selector is used to close the battery circuit for transmitter feed to the line, the previous line circuit being the old three-wire circuit for signal transmission in setting up the connection.

1,268,221. Three-Wire Automatic System. Issued to B. G. Dunham, assignor to Western Electric Company, Inc., New York, N. Y. (Application filed October 5, 1904.) The system shown is the three-wire Strowger system, and the improvement refers to circuits for energizing the bridging holding magnets and release magnets of the system.

1,269,181. Linefinder System. Issued to H. J. Herink, assignor to Relay Automatic Telephone Company, Ltd., London, England. A system of finding a calling line and connecting it to an idle trunk leading to a selector, the entire line-finding system being composed of relays without any movable-brush type of switches.

1,269,425. Hook Switch. Issued to John T. Gray, Great Falls, Mont. In addition to the usual flexible switching

springs common to hookswitches, a switch of the knife-switch type is operated by the lever of the hook.

1,269,453. Automatic System. Issued to A. E. Keith, assignor to Automatic Electric Company, Chicago, Ill. (Application filed August 20, 1906.) As each trunk is taken by a calling line, the next trunk is selected in readiness for the next calling line, as in the Keith line unit. Party lines are provided for, with provision for ringing back for a second station to be called upon the calling line, and means for taking off the busy test from the calling line to permit this reverting action.

1,269,499. Recall System. Issued to Samuel Paterson, Kenton, Manitoba, assignor to Kellogg Switchboard and Supply Company, Chicago, Ill. To facilitate the calling subscriber in recalling the operator, this improved cord pair has a ring-off relay and also a re-call relay, and the calling party may operate either relay from his telephone.

Opposed to Compulsory Uniformity

Legislation for the compulsory adoption of the metric system of weights and measures seems to be as far from realization in the United Kingdom as in this country, says *American Industries*. A most important British committee, namely, the Committee on Commercial and Industrial Policy After the War, to which, among other subjects, was referred the question of the desirability of the compulsory adoption of the metric system, has recently made its final report to Parliament. While the committee was not unanimous on other subjects, so far as the matter of the metric system was concerned its report had the endorsement of the full committee and is summed up in the following words: "Having given very full consideration to the subject we are unable to recommend the compulsory adoption of the metric system in this country."

As compulsory adoption is still being advocated in the United States by a special organization for that purpose, we quote the British committee's full report on this particular subject:

THE METRIC SYSTEM IN THE UNITED KINGDOM—ITS COMPULSORY ADOPTION OPPOSED BY A COMMITTEE APPOINTED TO REPORT UPON THIS SUBJECT.

Among the subjects referred for consideration to the British Committee of Commercial and Industrial Policy After the War, was that of the question of recommending compulsory adoption of the metric system. This committee has recently made its final report and it was unanimous in its opposition to compulsory adoption of the metric system. The committee's report on this subject, which is found in Chapter X of the committee's full report, reads as follows:

Having given very full consideration to the subject, we are unable to recommend the compulsory adoption of the metric system in this country.

In our opinion, it is absolutely certain that the anticipated uniformity could not be obtained for a very long period, if ever.

There is, further, the serious objection that if we induced the above mentioned countries to change over to the metric system, we should be surrendering to Germany the advantage which our manufacturers now enjoy over hers, both in their markets and our own.

We are informed that even in France, which has made the metric system nominally compulsory for more than half a century, the "pouce" (or inch) is used in textile manufacture and numerous local measures still survive.

In referring to these considerations, we have to point out that there is no unanimity even as to the theoretical merits of the metric system as compared with our own. The practical argument that its adoption is desirable in order to secure uniformity in the markets of the world has been shown to be unfounded. We are not satisfied by any evidence which has been brought before us that trade has actually been lost to this country owing to the fact that the use of the metric system is not compulsory.

But to attempt to make the use of the system universal and obligatory in this country would cause great loss and confusion at a particularly inopportune moment for the sake of distant and doubtful advantages. We are convinced that, so far from assisting in the re-establishment of British Trade after the war, such a measure would seriously hamper it.

As regards the educational advantages claimed for the change, we have been referred to a statement quoted by the Select Committee of 1895 that no less than one year's school time would be saved if the metric system were taught in the place of that now in use. The information which we have received does not support that statement, and even if it were well founded, it must be remembered that for at least a generation children would have to learn both the new and the old measures and how to convert from one to the other.

It is often popularly supposed that the introduction of the metric system would render possible the immediate sweeping away of many complicated and varying weights and measures. As we have already indicated, this belief is, in our opinion, wholly fallacious.

We are not convinced that the metric system is, upon the whole, even theoretically superior to the British system, and we are satisfied that the practical objections to the proposed change are such as decisively to outweigh any advantages which are claimed for it.

Walnut Wanted

The Bureau of Aircraft Production of the War Department has requested the widest possible publicity given to the vital need of black walnut wood for use in making aeroplane propeller blades and gun stocks. The Bureau states that black walnut has been found to be the best and most desirable wood in the construction of gun stocks, and aeroplane propellers. Both of these are essential parts of war machinery.

Black walnut trees are scattered through different parts of the United States, growing in small groups, and in taking the necessary steps to see that these trees are made available to the Government, the owners of the trees are afforded an opportunity to demonstrate their patriotism in a most practical and effective way.

No trees which produce logs less than twelve inches in diameter should be cut, as they do not yield material suitable for government use. Owners of black walnut trees can probably find out in their community which sawmills have Government contracts, but if this information is not available, they should write, giving the number of trees and their location to the Ordnance Department, Production Division, Small Arms Section, Washington, D. C.

Meals by Telephone

To order a hot dinner for one person or for as many as six or a dozen persons by telephone sounds almost Utopian. But it may become a commonplace part of American life if a project to be tried out in New York city is successful. For the American Cooked Food Service Company has been incorporated there and is said to have strong financial backing. Its purpose is to do the very thing about described—to place on your table a well-cooked, hot meal, delivered at any hour of the day you may name and at a price that will make home cooking a luxury.

A number of widely known men and women, most of them quite wealthy, are said to be sponsors of the project which is along more or less Socialistic lines and designed as a philanthropic measure, but nevertheless expected to pay its way from the beginning.

The new company will establish one station at first in a district where it is believed the need is most apparent. This district will serve an area of two square miles. It is planned, however, to keep right on by establishing other food stations until the entire city has been covered.

Public Utility Commission News

Reports Concerning the Activities of State Regulating Bodies in the Telephone Field

California

THE Pacific Telephone and Telegraph Company and Southern California Telephone Company make application to the State Railroad Commission for modifications of conditions in the decision of the commission in authorizing the telephone merger in Southern California in December, 1916.

According to the companies the conditions are now obsolete, because the order "has, through subsequent developments, become inapplicable to the effective and economic administration of service."

The company asks for a review to modify these conditions.

The conditions were that the new holding company would never use impartiality in the solicitation or installation of manual or automatic instruments, but would leave the choice to subscribers.

The regions directly affected by the conditions are Los Angeles and environs and Riverside and its connection with Arlington.

Florida

Florida's railroad commissioners have declined to approve the charge of $3.00 for moving telephones from one place to another inside a building and of $5 to $15 for outside moves. These rates were quoted by Mr. Burleson in his order 1931. Gaines & Futch took up the matter with the Florida commission and the reply was the statement that the charges have not been approved for Florida phone companies.

Georgia

In refusing to take action on the petition of the Southern Bell Telephone and Telegraph Company of an increase in rates throughout the state, C. Murphy Candler, chairman of the state railroad commission, with which body the petition was filed, stated that since the federal government has assumed control of the telegraph and telephone service of the nation any rates that the commission might fix would not be binding.

Mr. Candler, in a letter to J. Epps Brown, first vice-president of the telephone company, stated that on September 13 last, the postmaster general issued an order under which David J. Lewis, chairman; Henry B. Thayer, vice president, American Telephone and Telegraph Company, and Charles V. McVey, president of the Ohio State Telephone Company, were designated to make the necessary studies and recommendations to the postmaster general with the view of standardizing the rate schedules of telephone service throughout the United States. He further adds that certain increased installation charges have been authorized by the federal authorities and these rates are being charged and collected by the telephone companies. Under these conditions the commission "does not deem it expedient at this time to hold a hearing nor take action upon the petition. The matter will be kept open upon the docket of the commission for such future direction as may be deemed proper."

Several weeks ago the Southern Bell Telephone and Telegraph Company brought a petition before the railroad commission asking for an increase in rates, but failed to file any proposed schedule of service charges. At this time the commission inquired as to whether the petition was brought by direction of Postmaster General Burleson, and the telephone officials replied that it was not.

Illinois

Judge Smith in the Circuit Court of Sangamon County has refused to grant a stay of proceedings in the order of the state public utilities commission to the Chicago Telephone Company to file a new schedule of rates between the city and suburban villages. The telephone company has an appeal case before Judge Smith.

The action was brought by Myer J. Stein, who charged that the company had no right to discriminate against the suburban villages, and that the city of Chicago had no right under any circumstances to fix the rates. Mr. Stein says he expects the commission to refuse a rehearing, and believes the suit will be sustained on appeal and that entire jurisdiction of telephones will be vested in the public utilities commission.

In an order entered by the state utility commission the Williamsville Telephone Company is given the right to increase its rates from $21 a year for independent lines and to $18 for party lines. In addition the company will charge ten cents for three-minute long distance communication between Springfield and Williamsville.

The application for the emergency order was filed with the state commission in November, 1917. The original petition asked for a toll charge between Williamsville and Sherman which was later withdrawn. The new rates mean an increase of $3 a month for telephone service. The order of the commission states that under present conditions the company cannot pay a sufficient interest on its investments, hence the new rate.

The State Public Utilities Commission has authorized the Murphysboro Telephone Company of Murphysboro to issue $125,000 bonds of its common capital stock.

The DeKalb County Telephone Company has been authorized by the Illinois State Utilities Commission to take over the business and property of the Farmers Union Telephone Company.

For war reasons the petition of the Metropolitan Telegraph and Telephone Company for permission to construct a telephone line from near Kankakee to Chicago has been dismissed by the commission without prejudice.

Indiana

The Farmers Mutual Telephone Company of Columbia City is authorized to increase its common capital stock from $100,000 to $120,000, and to issue $95,750 par value thereof.

It is ordered by the commission that of the $95,750 of common stock authorized, the company shall issue $8,800 for the purpose of retiring an equal amount face value of bonds outstanding. The remaining $86,950 of stock shall be sold and the proceeds used to reimburse the treasury of the company for expenditures made.

At a meeting held in Lafayette opposing factions agreed to a sale of both telephone companies, the Boswell Telephone Company and the Farmers' and Merchants' Co-operative Telephone Company, on November 1, following the appraisal of both properties by a board of trustees now in charge of both systems, the sale to be held at Boswell.

The meeting was called by Chairman Lewis of the state commission. There were present Mr. Lewis, representing the state commission; President Charles Lawson, Secretary Floyd Christley and Attorney McAdams, of the Boswell company; and President W. J. Lawson, Secretary Orr and Attorney Dan Fraser, of the Farmers' company. The trustees appointed are: Frank O. Cuppy, of Lafayette; T. Timmons, of Lochiel, and H. O. Garman, chief engineer of the public service commission. The trustees made arrangements for inventorying and appraising the telephone companies.

It was agreed at the meeting to connect the two lines immediately and give subscribers of both systems the double service. The sale will result in a final unication of the properties and single control. Each system is to be appraised separately and after the sale the proceeds are to be divided between the old companies on the basis of the valuation of each of the old systems. The Boswell telephone war grew out of the attempt of the Farmers' company to connect its rural lines with the system of the Boswell company in the town of Boswell. The case has been in the courts for several years.

Five eastern Indiana telephone companies have merged into the Eastern Indiana Telephone Company, Winchester, on consent of the public service commission. The E. I. T. Company was authorized to issue $262,000 common stock to acquire the properties, valued at $257,962. The merging corporations went in at the following figures: Eastern Indiana Telephone Company, $129,234; Ridgeville Telephone Company, $21,177; Redkey Telephone Company, $22,690; Farmland Telephone Company, $29,620; Lynn Local Telephone Company, $55,041.

Kansas

The Peoples' Home Telephone Company of Leavenworth has made application for permission to raise the rates 25 cents a month on resident individual and two-party lines in Leavenworth. This application was filed September 5 with the Public Utilities Commission of Kansas but nothing was known about it in Leavenworth until October 15, when Carl W. Moore, secretary of the commission, announced that a hearing on the application would take place in Topeka on November 25.

H. W. Sexton, manager of the People's Home Telephone Company, said:

"We have asked for permission to raise the rates, and under the ruling made by the Utilities Commission when the rates were increased in December, 1917, we expect that the application will be granted. We are asking for this to take up the raise of wages to employes. In the other decision an increase amounting to about $5,000 a year was allowed to cover a raise in employes' salaries, and there has been a further increase in salaries since that which justifies us in asking for this new increase.

"The wages paid at present has been fixed by a government board and we have nothing to do but to meet it. The raise asked for in the application is not sufficient to meet the increase in salaries and it ought to be more."

The application is to allow increase of 25 cents a month in rates on all individual resident and two-party lines in Leavenworth, Fort Leavenworth and wherever the People's Home Company supplies telephones. There are 2,233 of these patrons of the company.

Michigan

Consolidated telephone service for patrons of the Union Telephone Company and the Michigan State Telephone Company, is provided for in an order of the Michigan railroad commission for all of Isabella and Midland counties, substantially all of Mecasta and Gratiot counties and parts of Saginaw, Shiawasse, Clinton and Ionia counties. This includes all the territory heretofore occupied by the Union company.

The Michigan State Telephone Company receives the exchanges formerly owned and operated by the Union at Farwell, Clare, Coleman, Midland, Byron and Fenton. The Union receives exchanges formerly owned by the Michigan State at Owosso, Corrunna, Mt. Pleasant, Shepherd, Alma, St. Louis, Wheeler, Ithaca and Breckenridge.

The order was forwarded to the Postmaster General for his approval.

All existing contracts including those with the Valley Home Telephone Company, are preserved, giving telephone subscribers in the territory advantages of consolidated service.

The order provides there shall be no change in rates, toll charges, rentals, rules, regulations or practice, without approval of the commission.

One of the chief advantages of the consolidation will be that all toll calls either originating or terminating in the territory affected will be terminated in the exchange of which the party called is a subscriber.

It is expected that because of the discrimination produced in rates by the consolidation adjustments will be necessary later, perhaps soon.

This consolidation leaves only the Citizens and Valley Home companies among the good sized corporations which do not give consolidated service.

Michigan State property to be acquired by the Union company is appraised at $319,444.10; and that sold by the Union to the Michigan State at $157,610.99, a difference of $161,833.11. The Union company, however, is to pay only 78 per cent of the difference, or $125,857.

Caro is again enjoying universal telephone service between the Moore and Valley Home systems.

A meeting of business men was held to learn who was at fault for the failure to observe the order of the State Railroad Commission issued last July. Alex MacVittie was chosen chairman, and after stating the object of the meeting, suggested that Mr. Moore and Mr. Trask be granted 5 minutes each in which to explain their position. Mr. Trask promptly said that he could not do his side justice in so short a time. Mr. Moore said two minutes would be enough for him, and Mr. Trask was granted the balance of Mr. Moore's time.

Mr. Moore said that he had complied with the order of the commission; that the trunk wires were connected at his end of the cable and that he had been ready to continue the service which had been cut off by Mr. Trask.

Mr. Trask entered into a detailed statement of the steps taken by the committee of business men before the Railroad Commission. He is preparing to make radical improvements to the system and service, stating that the cost would exceed $6,000 and might reach $7,000. It appeared that most of the trouble came from differences between the two managers over the question of calling by name or number. Mr. Trask insisted that Moore service should be given over Valley lines when the name of the subscriber was called. Mr. Moore declared that method impracticable with the number of instruments connected with his switchboard, and instead that the calls should be made by number. Mr. Trask admitted that the number system is used in his Saginaw exchange, and that eventually, after his improvements should be completed, that the number system would be the better to employ.

Numerous questions were asked, then the temper of the meeting was indicated by the adoption of a motion that unless the dual service should be given the following day, steps would be taken by all business men present to use but one telephone system.

Minnesota

The Worthington Telephone Company has for a number of years operated a local telephone exchange at Worthington, Minnesota, and rural lines in the vicinity, and now serves approximately 763 local and rural stations. The present rates of the company are as follows:

Individual Line Business	$2.25 per month gross
Two-party Line Business	2.25 per month gross
Individual Line Residence	1.25 per month gross
Two-party Line Residence	1.25 per month gross
Desk telephones in residences	1.50 per month gross
Multi-party Rural	1.25 per month gross
Rural Switching	5.00 per annum gross

A discount of 25 cents per month is allowed from the above rates for prompt payment except that in the case of rural switching a discount of 25 cents per quarter is allowed for prompt payment.

It is ordered that the Worthington Telephone Company be authorized to place in effect, as of November 1, 1918, the following schedule of rates for local telephone service at Worthington, Minnesota:

Individual Line Business	$2.75 per month gross
Two-party Line Business	2.25 per month gross
Individual Line Residence	1.75 per month gross
Two-party Line Residence	1.50 per month gross
Four-Party Line Residence	1.25 per month gross
Rural Multi-party	1.25 per month gross
Rural Switching	5.00 per annum gross

A discount of 25 cents per month is to be allowed from the above rates if the bill is paid on or before the 16th of the month in which the service is rendered except that rural switching rates are payable quarterly in advance, and a discount of 25 cents per quarater is to be allowed if the bill is paid on or before the 16th of the first month of the quarter in which the service is rendered.

It is further ordered, that the company immediately discontinue furnishing telephone service at free and reduced rates; also that it install a system of accounts in accordance with the uniform system of accounts prescribed by the commission.

The Northwestern Telephone Exchange Company, operating numerous local exchanges and an extensive system of toll lines in this and other states, operates a local telephone exchange at Hawley, Minnesota, serving 140 telephones within the village and performs a switching service for 201 rural subscribers in the vicinity.

The present rates of the company are:

Individual line business, per month	$2.25
Individual line residence, per month	1.50
Two-party line residence, per month	1.00

It is ordered that the Northwestern Telephone Exchange Company be permitted to place in effect as of November 1, 1918, the following schedule of exchange rates for local telephone service at Hawley, Minnesota:

Individual line business, per month	$2.50
Two-party line business, per month	2.00
Individual line residence, per month	1.50
Two-party line residence, per month	1.25

The Farmers-Two Rivers Rural Telephone Company was organized and began operating in 1906. It now operates local telephone exchanges at Lancaster and Bronson, with rural lines radiating therefrom, serving 47 local and 214 rural subscribers. The company charges $1.00 per month for all classes of service. This rate entitles the subscribers to service with both exchanges. The company operates a toll line between Lancaster and Hallock, connecting at that place with the Kittson County Telephone Company for toll service.

It is ordered that the Farmers-Two Rivers Rural Telephone Company be permitted to place in effect, as of November 1, 1918, the following schedule of rates for local telephone service at Lancaster and Bronson, Minnesota:

Individual line business, per month	$1.25
Individual line residence, per month	1.25
Four-party line residence, per month	1.00
Rural multi-party	1.00

The Polk County Telephone Company, organized in 1905, operates a local telephone exchange at Beltrami, Minnesota, and rural lines in the vicinity, serving approximately 67 stations; also rural lines in the vicinity of Crookston, Minnesota, serving 61 stations.

The present rates are:

Individual line business, per month	$1.16⅔
Two-party line business, per month	1.16⅔
Individual line residence, per month	1.16⅔
Two-party line residence, per month	1.16⅔
Multi-party rural (Beltrami), per month	1.16⅔
Multi-party rural (Crookston), per month	1.33⅓

It is ordered that the Polk County Telephone Company be authorized to place in effect, as of November 1, 1918, the following schedule of rates for telephone service at Beltrami, Minnesota:

Individual line business, per month	$1.50
Individual line residence, per month	1.25
Multi-party rural, per month	1.16⅔

It is further ordered that the company install a system of accounts in accordance with the uniform system of accounting prescribed by the commission.

The Minnesota Railroad and Warehouse Commission refused to suspend investigation of the reasonableness of telephone toll rates at the request of Postmaster General A. S. Burleson of the Federal telephone and telegraph administration.

The commission's answer was forwarded to Washington.

"Mr. Burleson first asks this commission to assist in fixing reasonable rates and now asks that it abandon or suspend inquiries to obtain the necessary information," said Commissioner Fred W. Putnam, explaining the attitude of the commission.

The investigation was begun pursuant to a senate resolution adopted during the 1917 legislature.

It started soon after the session adjourned and the telephone companies had pledged co-operation.

The appraisal of physical properties was rushed and is rapidly nearing completion.

After the government assumed control of the telephone and telegraph systems, however, officers of large companies operating in Minnesota, petitioned for suspension of the accounting inquiry into rates, revenues and other book records.

The commission denied this and then by request adopted an order September 24 directing continuance of the work.

The contention of telephone officials that Government control leaves no funds available for a check of the state work is given by Postmaster General Burleson as the main ground for the request for suspension of the investigation.

He adds that he has appointed a committee to investigate and report to him upon the feasibility of establishing a standardization of rates for telephone service during the period of government control.

Telephone companies in Minnesota will lose approximately $100,000 a year as a result of the installation charge authorized by federal authorities, is the opinion of F. W. Putnam, state railroad and warehouse commissioner, who has asked A. S. Burleson, postmaster general, in charge of the telephone administration, to exempt Minnesota from its order.

"It is safe to say that probably 50,000 telephone subscribers will take out their telephone rather than pay installation charges," said Mr. Putnam.

Missouri

Editor TELEPHONE ENGINEER:—In a recent [October] issue of TELEPHONE ENGINEER, under the section Public Utilities Commission News, I notice you have the item "The Public Service Commission of Missouri has fixed a uniform price of $1.25 per month for all telephones in Excelsior Springs, effective September 1."

Your information is evidently in error, and that you may have the facts in the case I wish to state that effective August 1 the Commission granted us an increase of 50 cents on the business telephones and 25 cents on residence telephones, making the present rate $3 for individual line business and $1.50 per month for individual line residence stations.—E. L. CHASE, Assistant to General Manager, Kansas City Long Distance Telephone Company, Kansas City, Mo.

Authority was granted the Kansas City Long Distance Telephone Company to increase its rates. The company filed application for such an order August 22, 1918.

It asked for permission to change both the system of making rates and the rates themselves. Regarding the existing plan of making rates, the petition said its present system of fixing tolls in Missouri has many irregularities and the plan suggested in lieu will tend to make but few changes in the toll rates on distances of thirty-five miles or less, but will increase the rate for long distance service in calls over thirty-five miles. It was further alleged in the petition that there is urgent need for additional revenue for the company in this state because of the great increase in the cost of operation. In support of this it is stated that it has been necessary to increase the wages of the traffic forces 25 per cent since 1916, and wages of plant employes 55 per cent since that date. For the first five months of 1918 the petition declares the revenue of the company decreased 1.9 per cent, while the expenses increased 17.7 per cnt.

The commission in granting the increase finds that the new plan will eliminate many irregularities and inconsistencies. It is specified in the order that the new schedule for intrastate rates shall not be upon any higher basis than the company's interstate rates at the time the new schedule is put into effect, so that there shall not be any discrimination between the intrastate and interstate rates.

The increased rate became effective October 1 and is to remain in effect for a period of nine months after the close of the war, when a complete report of the revenues under it must be made to the commission for the first six months after the war, so that it can be determined whether it should be discontinued.

New York

Gov. Whitman desires the up-State Public Service Commission to interest itself in the legal fight other state commissions are making against Postmaster General Burleson's order fixing unreasonable rates for telephone installations and removals. The governor also asks for a legal interpretation of the act of Congress which transferred all telephone companies to the jurisdiction of the Postmaster General.

"I am deeply interested in the newspaper articles reflecting dissatisfaction over the telephone installation and removal charges," said the governor, "and I believe the whole question of whether the state commissions have any power now should be settled. If Congress intended that the states should continue to exercise certain powers even after federalization of lines, that fact should be made clear. There seems to be a legal question raised. Personally I haven't gone into the matter sufficiently to express an opinion one way or the other.

But it strikes me that if newspapers give so much prominence to this question of telephone installation rates and charges, the Public Service Commission having had full supervision before Congress acted, the entire situation should at least be cleared up in an opinion. I wish to be emphatic in stating that I do not question the Government's rights. But we are at least entitled to a legal interpretation of the act of Congress which federalized the telephone."

The particular section of the Federal law which, it is claimed, preserved the powers of state commissions even after federalization of telephone companies, is the basis of a test case by the Nebraska Commission.

The Public Service Commission, Second District, learned from reports of its inspectors and from other sources, that in many communities the operating forces of the telephone companies were seriously depleted by the prevailing epidemic of influenza.

This resulted in a very serious impairment of telephone service and at the same time the prevalence of illness created a greater demand for the service. In one of the smaller cities, out of a regular force of thirty operators ,there were only three regular operators on duty.

The commission appealed to the public in communities where the epidemic prevails and in those where it might later appear, to use the telephone as little as possible and for only strictly necessary purposes as long as the epidemic should prevail.

Nebraska

The Nebraska State Railway Commission has asked for an injunction in the federal court at Lincoln, alleging that the act of congress authorizing the president to take over telephone companies confers no authority whatsoever to initiate rates for services by telephone companies. The suit is intended to test the right of the postmaster general to establish charges for intrastate service for telephone companies.

The commission refused an application of the Nebraska and Lincoln telephone companies the authority to make installation and removal charges directed by Postmaster General Burleson. "This commission is not a rubber stamp," said Commissioner Wilson. "We will not approve additional telephone charges without a hearing, just because a government official tells us to do so."

General Attorney E. M. Morsman and General Manager G. H. Pratt of the Nebraska Telephone Company presented the formal application of that corporation for a 20 per cent increase in rates to the state railway commission. A conference followed between members of the commission and the company officials.

The petition shows that the company's property and business are now in the hands of the United States government; that prices of material and costs of labor have greatly advanced during the war; that a deficit now exists because of insufficient revenue; that it will require $400,000 a year more to meet wage increases necessary to be made, and that from $800,000 to $900,000 a year of additional income will be required to meet all increased costs.

A uniform increase of 20 per cent in all exchanges and toll rates now being charged by the Bell concern in Nebraska is asked for, with provision that the scale of new rates shall be fixed so as to specify even nickels and either drop or add odd cents to attain that object.

The state railway commission has authorized the Steele City Telephone Company, which has exchanges at Steele City and Endicott, to increase its rate from $1 a month for all classes of telephones to $1.50 for business and $1.25 for residence and farm telephones. No hearing was held.

North Carolina

The corporation commission, having the second request of the Southern Bell Telephone Company before it for permission to increase rates on account of the increased wages and other increased cost of operation, has advised the company and Postmaster General Burleson, through whose instructions the reference to the commission was made, that the commission will not reopen the matter unless there are assurances that their orders will be final. Members of the commission seem to think that with government operation in force, the federal authorities should take the initiative and take final action in this matter unless the issue is left wholly with the State commission. The commissioners say they are perfectly willing to act if their findings are to have usual force and effect; but that they do not want to act and then have to leave the matter ultimately with the postmaster general.

Ohio

It is estimated that at least 400 public utilities of Ohio have filed schedules of increased rates with the commission in the past six or eight months and have had the advances granted.

Estimates obtained at the commission offices today tell briefly the story of what happened in Ohio:

Of Ohio's approximately 550 telephone companies, thirty-five or forty per cent have increased their rates. New telephone schedules of rates have been coming to the commission at the rate of three or four a day.

Of approximately 325 electric light companies in the state, not fewer than half have been granted increased rates.

There are about 150 natural gas concerns in Ohio, and at least seventy-five have higher rates now in effect.

Of approximately fifty interurban lines in Ohio, thirty-five have advanced their fares.

New rates to be charged by the newly consolidated Coshocton Telephone Company, approved by the Ohio Utilities Commission at Columbus are as follows:

Two-party residence	$1.50
Individual residence	2.00
Two-party business	3.00
Individual business	3.50
Farmer residence	1.50
Farmer business	2.00
Business extension	1.00
Residence extension	2.00

Those are the net rates. In case the bills are not paid by the 15th of the month, an additional charge of 25 cents is made. The bills will be made out 25 cents in advance of the above rates, subject to the discount.

Increased rates of the Ohio State Telephone Company are in effect. The new schedule, which was allotted by the public utilities commission, provides for a uniform advance of $24 a year on more than one trunk line, $12 a year on business service, and $3 a year on residence service.

Oklahoma

As a result of numerous complaints against telephone companies in many sections of the state, including Oklahoma City, the corporation commission is filing with Postmaster General Burleson an urgent request for interpretation of his recent order establishing charges that telephone companies may make for new installations.

The order fixed a graduated scale of installation charges, ranging from $4 to $15, the charge depending upon the monthly rate for the telephone service. In Oklahoma City the installation charges average $10 on residence telephones.

It has been brought to the attention of the commission that in cases where a telephone is already installed and in use in a house, which is being vacated by one tenant, the incoming tenant, if he desires to continue the service, is required to pay the installation fee.

The corporation commission will also bring to the attention of Mr. Burleson the fact that the charges he authorized are far in excess of what the telephone companies asked in an application filed with the commission a short time before the Washington order was issued.

Approximately 250 small Independent telephone companies in Oklahoma were given permission by the corporation commission to advance rates for service on and after November 1. Only about seventy-five of the companies applied for the increase, but the investigation made by the commission disclosed the fact that the other companies which had not applied were facing the same problems as those which had asked the increase. The action of the commission is in the nature of a general order allowing any small company in the state which desires to, to take advantage of it.

The new schedule approved by the commission provides the following extra charges: Individual line, business, $30; individual line, residence, $18; multi-party, rural, $15; business extensions, $9. Where a higher rate is in effect than the one fixed by the commission it may continue in effect, the order states. The order will be sent to Washington for final approval by Postmaster General Burleson.

Oregon

The public service commission, through Commissioner F. J. Buchtel, informed James T. Shaw, attorney for the Pacific Telephone & Telegraph Company, of the erroneous application by the company of the postmaster general's order of August 28, whereby the company was assessing against its patrons installation charges of $5, $10 and $15 on applications made prior to September 1, the date on which the order was to become effective. The service commission takes the stand that the ruling affects only applications made on September 1 or thereafter. The letter was also directed to E. Boyles, of Portland, and a copy will be sent to Postmaster General Burleson. Numerous complaints received are mentioned in the letter, and the following statement is made in that regard:

"In order that there may be no future misunderstanding, we have herein indicated our position rather fully and trust that such steps will be taken by your company as will eliminate cause for complaint in matters brought to your attention.

"While the telephone system is now under federal control the commission has no intention of surrendering to the utilities jurisdiction that is guaranteed under the president's proclamation.

"This commission is in receipt of numerous complaints, both oral and written, from patrons and prospective patrons of your company, as well as of other telephone companies, that these charges are being made on installations made subsequent to September 1, under applications filed prior to that date. A number of smaller telephone companies have also requested this commission to interpret the order in this respect, and in view of existing conditions we deem it expedient at this time to make such interpretation for the general information of those concerned and to obviate any further confusion in this connection as between applications filed previous to the effective date of this order No. 1931 and those filed subsequent thereto.

"Inasmuch as this charge is to be collected at the time of application and order No. 1931 did not become effective until September 1, it is the opinion of this commission that any service connection charges to be applied by companies in installations under applications filed prior to September 1 should be those in effect previous to that date.

"Many of your prospective patrons, realizing the difficulties under which your company was laboring, due to the shortage of material and other abnormal factors, have, after making application, patiently awaited for weeks, and in some instances months, the installation of their telephones, and we are also of the opinion that it is manifestly unfair at this time to further penalize these applicants under rule 1931, when the direct cause of the proposed assessment was the inability of the company to furnish adequate service."

The commission later received a communication from H. D. Pillsbury, vice-president of the Pacific Telephone & Telegraph Company, announcing that the company is no longer imposing installation charges of $5, $10 and $15 on applications for service filed before September 1.

On application brought by the Newberg Telephone Company for authority to readjust its rate charged for portable or desk telephones, the commission rules that it is an established fact that the cost of an installed desk or portable set and the maintenance expense attached thereto, is sufficiently in excess of that for the ordinary wall type instrument to justify a distinction in the service rates for the two types of equipment. The justification for such distinction need not be explained further than to state that the very characteristic which gives the portable instrument its attraction to users gives rise to increased maintenance expense on account of parts broken from falls, worn cords, etc., not encountered in the use of ordinary equipment. Because of these facts the applicant claims that this service is becoming burdensome and that an extra charge of twenty-five cents per month should be allowed for these instruments.

The rate of twenty-five cents per month requested by the applicant is the standard additional charge in common use by other telephone companies throughout this and other states, for this type of equipment, and does not seem to be unreasonable in this instance.

It is, therefore, ordered that the company is permitted to

charge, impose and collect for the furnishing of portable or desk telephones, in lieu of the nominal charge of one dollar now collected upon installation, a rate of twenty-five cents per month in addition to the regular monthly party exchange service rate.

In order that no undue burden may be imposed upon subscribers now using desk-type installations, the company will be permitted to credit such subscribers, who have paid for such installations within the six months last preceding the date of this order, with the additional charges made against them for the service.

It is ordered that the Clatskanie Telephone Company, upon the condition that it will give good and adequate service to its patrons at all times, and within a reasonable period after the date hereof submit satisfactory showing that it has repaired and placed its lines and equipment in such condition as to insure continuity of such reasonable service, be authorized to discontinue its present rates and practices in so far as they may conflict with those hereinbefore found to be reasonable, and to substitute in lieu thereof these rates and practices found to be just, reasonable and not unjustly discriminatory:

Business service, individual line, per month	$2.50
Business service, two-party line, per month	2.00
Business service, four-party line, per month	1.75
Residence service, individual line, per month	2.00
Residence service, two-party line, per month	1.50
Residence service, four-party line, per month	1.25
Rural service, company-owned lines, per month	1.50
Switching, city subscribers on connecting lines, per month	1.00
Switching, rural subscribers on connecting lines, per year	5.00

After the reservation of $600.00, which it has been determined should be set aside as an annual depreciation allowance to preserve the investment and continue the property in serviceable condition, an annual net operating income of $420.00 would be available under the assumption that conditions prevailing during the period prior to May 31, 1918, will continue.

It is further ordered that the Clatskanie Telephone Company shall set aside each year in a reserve fund the amount herein fixed as an allowance for depreciation or such moneys as may be available for that purpose prior to the payment of dividends, and shall expend said money only as provided by Chapter 279, Laws of Oregon for 1911.

Tennessee

The Tennessee Railroad Commission issues to the telephone companies of the state the following warning:

Whereas the postmaster general of the United States in his order No. 1931, as published in bulletin No. 5, regulating the charges for the installation of telephones, and for changing the location of telephones, fixed the rates as follows, to-wit:

Where the rate is $2 per month or less, $5.

Where the rate is more than $2, but not exceeding $4 per month, $10.

Where the rate is more than $10 per month, $15; and

Whereas, said rates were carried into effect without the approval of this commission, which was withheld on the ground that there had not been any investigation or facts shown to justify these rates, and

Whereas, the postmaster general of the United States subsequently issued bulletin No. 8, explanatory of the terms of his order No. 1931.

Whereas, complaints continue to come to this office alleging that efforts are being made on the part of the agents of telephone companies to collect service-connection charges in violation of the rates as set out in order 1931, and explained in bulletin No. 8 above set forth, therefore,

The Tennessee Railroad Commission warns the telephone companies doing business in Tennessee not to collect service-connection charges under the above order of the postmaster general in excess of the strict terms as set out in order No. 1931, bulletin No. 5, and explained in bulletin No. 8, and telephone subscribers are requested to report to this commission any violation or attempted violation of the rules and regulations affecting said charges as above set forth.

Wisconsin

While not approving the system, principle nor amounts, the Wisconsin Railroad Commission granted the Wisconsin Telephone Company the right to inaugurate installation charges ordered by Postmaster General Burleson, director general of the telegraph and telephone lines.

Dallas, Texas, Reorganization

Royal A. Ferris, president of the American Exchange National Bank of Dallas, Tex., and one of the best known business men of the Southwest, was named president of the new Dallas Telephone Company at a meeting of the officials of the Southwestern Telephone Company and the Dallas Automatic Telephone Company. The two companies have secured a merger franchise and after minor details are worked out a single telephone system will be in operation.

J. C. Casler, president of the Dallas Automatic Telephone Company since that company began business declined the presidency of the new company some time ago, but was named vice-president of the new company. Mr. Casler's other duties were of such importance that he said he could not accept the presidency of the new company. Casler recently was named president of a million dollar oil company with holdings in the Burkburnett oil field.

Ben S. Reed of St. Louis was also elected vice-president.

W. R. Faught of Dallas was selected as secretary-treasurer of the new concern and A. B. Elias of Dallas will be general manager.

Following is the new executive committee: Royal A. Ferris, Edgar L. Flippen, A. B. Elias, Clarence E. Linz and H. J. Pettingill of St. Louis.

It was announced that the physical merger of the two companies would be made within a few months, as soon as the new equipment could be secured and engineers could complete their survey of the two plants. It was further announced that the system to be used by the new company would be left to the choice of the subscribers.

In merging the two physical plants, it was announced by Mr. Pettingill that the new corporation would follow as closely as possible the Los Angeles plan. Two companies merged there recently with great success and satisfaction not only to the officials but to the patrons.

Several of the telephone officials were called to the office of Mayor Lawther, of Dallas. The mayor told the officials he had noticed in the press that there was talk of an out of town man being named president of the new company. He reminded the officials that they had on numerous occasions given out statements over their own signatures saying that Dallas men would be placed at the head of the new company and that it was the intention of those interested to have Dallas men to head the new institution and to have full charge of its affairs.

After the conference the mayor said he wanted it understood that there was no disagreement nor was there a demand regarding the election of officers but said that he merely called the conference to remind the officials of their promises and to verify the report than an outside man would be named president of the new company.

The capital stock of the Dallas Telephone Company as reorganized is $5,000,000.

Interstate September Report

Compilation of the earnings of 61 telephone companies by the Interstate Commerce Commission shows operating revenues for September of $28,155,589, which was $1,426,418 more than for the same month of the previous year. Net operating revenue was $8,366,354, a decrease of $194,242.

European Telephone Practice

Translations from the Foreign Press and Communications from European Engineers

THEORY of the Telephone.— BY FRED W. SCHOLZ

It has often been said and repeated that a satisfactory problem of the telephone was impossible, because the telephonic effect can still be obtained from a receiver, deprived of its magnet and of its vibrating diaphragm, i. e. having lost its vital parts.

This objection does not seem to be very well grounded: if a simple coil is still capable of making sounds understood, nevertheless the reproduced sound is low and weak that one is tempted to attribute the principle of the effect to the iron and to the diaphragm.

Moreover, the reproduction of sounds by a coil alone might be very well explained by the general electromagnetic effect, such as that which one notes, for example, between the different coils of a transformer.

Mercadier, whose ideas on the telephone are still authoritative and in a way have become classic, was struck by another difficulty, more serious than the above.

This is, that the telephone might be susceptible of reproducing nearly equally well all sounds, whatever be their loudness, or, in other words, that the field of resonance of the telephone might be uniform enough to give a fairly perfect reproduction of sounds, both consonants and vowels.

Starting out from this fact, Mercadier said that the principal part of the telephonic effect could not be attributed to the elastic displacements of the diaphragm as a whole, without taking note also of the change in the transmitted sounds, since the periods of the different sounds transmitted could coincide except in very isolated cases with the natural sounds of the vibrating diaphragm.

However, the theory of the reasonance of deadened or reduced systems shows that a diaphragm sufficiently weakened possesses a field of reasonance, which, while certainly not uniform, is still regular all the same. Did Mercadier remark that a telephone diaphragm is very much deadened?

To show that his views were correct, Mercadier constructed a mono-telephone by fixing the vibrating diaphragm by three or four points of its surface at points which corresponded to the sound of a diaphragm whose nodes were passing straight through the points of support. Did Mercadier take account in this experiment of the fact that the deadening effect of his diaphragm would become very low?

A diaphragm fixed at its center or at three or four points of its periphery only, vibrates, when we strike it, during an incomparably longer time than when this same diaphragm is fixed on supports along its entire periphery. In this latter case, which is that of the normal telephone, the sound given forth by the struck diaphragm is extinguished so quickly, that one has very great difficulty in noting its loudness (provided it can even be noted at all); in weak telephones we can even say that the diaphragm struck gives no well defined sound at all. In short, the diaphragm of the normal telephone is incomparably more deadened and weakened in sound than the mono-telephone of Mercadier's experiment. In the latter the relative deadening effect must have been of a magnitude ranging from 1/20 to 1/50 and under these conditions the resonance curve presents at best an extremely limited aspect and it is not at all astonishing that the apparatus gives rise to a well characterized effect, not found under normal conditions.

Whatever the reasons may have been, Mercadier explained the uniform or indifferent resonance of the telephone by molecular movements of the "Page" type and he considered the elastic movements of the vibrating diaphragm as distinctly harmful to good reproduction of sound. Besides, for Mercadier, the telephonic effect was above all due to that portion of the magnetic lines of force which cross the coils; i. e., the effect was due in some way to magnetic losses.

But why these hypotheses? Is it necessary to explain the different details of the working of the telephone, to make use of these phenomena of the second order? Are these hypotheses necessary which, we must admit, seem to discourage all explanation of a theory of the telephone?

I am going to try and show that they are not as discouraging as might seem at first glance and to bring forth a theory which will explain all the well known facts of the telephone and will also include the uniformity of resonance. In this attempt I shall make use of the most evident and simplest phenomena and show that they play a very important role. In order to do that, I shall translate very simply into mathematical language the entire former explanation made of the working of the telephone. We shall see that it was sufficiently exact and fruitful and that it was abandoned too hastily. This explanation reads as follows:

The major portion or a good portion of the magnetic flux passes into the interior of the cores of the coils and into the diaphragm, which form a closed magnetic circuit of variable reluctance. This reluctance is variable owing to the variations of the air gap due to the movements of the vibrating diaphragm. These changes in reluctance give rise to correlated variations of the magnetic flux in the interior of the coils, and some induced currents are produced within their circuits. This process is reversible, if we look upon the telephone as a receiver.

The only concession which I shall ask the reader to make will be to neglect the leakage flow of the magnet and to consent to applying to the average remaining flux the equation of Hopkinson. I may also add, that I have constructed a telephone without leakage flow, which notwithstanding Mercadier, works as well as the other telephones. This then will be, if we wish to be exact, "the theory of the telephone without losses."

From the viewpoint of Mercadier's chief objection the most important conclusion of this study is in short the following: In the telephone we do not have to deal with a vibrating diaphragm alone but rather with an entire series, made up of: the diaphragm—the magnets—the coils. This system has a field of resonance which is not necessarily the same as that of a diaphragm alone, and is, as a matter of fact, under certain conditions, much more uniform than that of the diaphragm which is part of the system. Moreover, in the ordinary telephone, the weakening of the vibrating diaphragm is more than sufficient in general, to explain the very real uniformity of

the resonance, since this diaphragm vibrates even before the magnet or the coils.

Let us imagine then a magnetic circuit formed of a curved magnet, terminated by two pole pieces of soft iron and closed in part by a vibrating diaphragm of soft iron. Two coils, surrounding the cores, complete the system. If we happen to apply to the coils of the telephone a periodic electromotive force which can be represented by a sine function of time, we know that the diaphragm gives forth a sound of constant intensity and

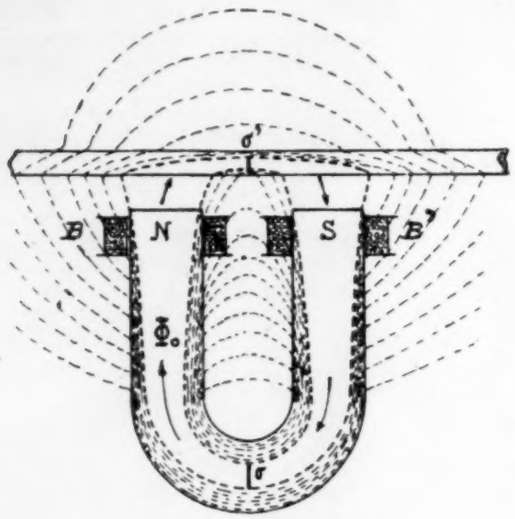


Fig. 1. Lines of Flux in Magnet.

loudness, provided the amplitude and the frequency of the e.m.f. applied are themselves constant. That is the musical or harmonic law. It is this simple and well known rule that we are going to study, leaving aside for the moment the transmission of general noises and of consonants, which we will take up later on.

In order that an e.m.f. of harmonic form $V=V_0 \sin \omega t$ should give an equally sinusodial simple vibration of the diaphragm, we must assume that we have to deal with very slight displacements and with relatively feeble variations of the magnetic flux.

In the telephone the expansions of the vibrating diaphragm are always very slight; as a matter of fact they are far too small, compared to the diameter of the diaphragm, for us to admit that there is a proportional relation of the elastic force to the displacement of the diaphragm at its center.

For reasons of symmetry we can assume that the diaphragm supported along its entire circumference and incited at its center by the magnet vibrates only in harmony with the fundamental deformation; in other words, it means that there are no nodal lines crossing the diaphragm, unless we wish to state that the two portions of the surface of the diaphragm are at each instance in a discordant phase, even though symmetrically excited by the field of force of the magnet, a supposition which is not at all reasonable.

As the size of the poles of the magnet is generally slight when compared to the surface of the diaphragm, we can simplify matters still more and replace the vibrating diaphragm by a limited armature, made up, like the diaphragm, of two plain faces, holding the same number lines of force as the diaphragm and following an identical configuration of the field of force.

Let us suppose that this armature is fixed on some imaginary springs without mass, and that it can vibrate uniformly with a period corresponding to the fundamental of the diaphragm. Calling C the elastic constant of the springs, M the mass of the armature and $\Omega=2\pi N$ the pulsation corresponding to the fundamental sound of the diaphragm, we would have: $\Omega=\sqrt{\frac{C}{M}}$

The mass M to be given to the armature could be obtained by an integral, expressing the fact that its vibratory energy is equal to the total vibratory energy of all the molecules of the diaphragm. This energy is for an amplitude of displacement equal to that of the center of the diaphragm. Likewise as concerns the weakening effect, one would have to take a coefficient, such as one has for an armature of the same decrease of amplitude as that of the diaphragm. This simplifying process takes away nothing from the general scope of our problem and permits us to obtain an equations of very simple type. Moreover we can define precisely the changes in reluctance of the magnetic circuit in relation to the changes of the air gap, which is also constant over the entire area of the poles. To simplify our language, we will make no distinction in the rest of the problem between the vibrating diaphragm and the equivalent armature.

An e.m.f $V=V_0 \sin \omega t$ being applied to the coils, there will result in these latter an equally periodic current i, which will produce variations of flux in the magnetic circuit. Under the effect of the variable attractive force due to the variable flux, the armature carries out, starting out from its forced position of equilibrium, some periodic elongations and expansions x. Moreover, since the armature is displaced in relation to the magnet, the reluctance will also vary. The magnetic flux in the coils Φ is then at the same time a functional of i and of x. Φ, i and x are the three unknown quantities of the problem; to determine them we must have three equations. Two are at once known: 1. The equation of the movement of the armature under the influence of the variable attractive force due to the flux Φ. 2. The equation of the current in the coils under the influence of the applied e.m.f $V_0 \sin \omega t$, and the e.m.f induced by the variations of the flux Φ. As to the 3d, it is this which connects di-

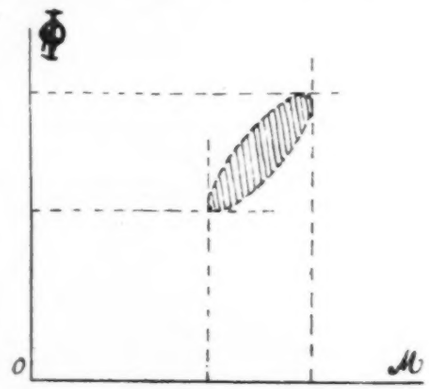


Fig. 2

rectly with the flux Φ to the current i and to the displacement x of the armature. As we do not wish to leave the harmonic functions and as we can consider only small movements and feeble variations of flux, this relation is of necessity a linear one. We can calculate these coefficients by applying the equation of Hopkinson to the magnetic circuit of the telephone.

This equation can be applied only to an entirely

closed tube of flux. Now, in the telephone, the flux of the magnet is closed at the same time by the cores of the coils, by the diaphragm and by the air. In other words, the diaphragm stops only a portion of the flux of the magnet by way of the cores of the coils. Since the diaphragm is displaced in relation to the magnet, the lines of force concentrate in more or less large numbers in the cores of the coils. Let us imagine then at each instant the greatest "tube of flux" which we can find at any instant in the iron of the magnet, of the cores of the coils and of the diaphragm, without leaving out any portion of the iron, excepting in the air gap. (See Fig. 1). This tube has by definition a constant section within the limit of the air gap, but within the middle of the magnet its section σ is variable, as also in the middle of the diaphragm at σ'.

According as the diaphragm approaches or leaves the magnet, there pass a greater or smaller number of lines of force in this tube and its flux varies. It is to this tube that we must apply the Hopkinson formula, since it is this which excites the coils. The average flux Φ_0 of this tube of force, which one might call the useful flux is moreover equal to the total flux of the magnet diminished by the leakage flux. In order to be accurate, we would have to take account of the action of the leakage flux in the coils. But this would only complicate calculations and in the first instance we shall neglect this action. The formula of Hopkinson would apply under rigorous conditions, if we had to deal with the telephone without magnetic losses, made up for example of a very short curved core, not magnetized by a magnet but by means of a constant current passing through the coils and coming from a battery placed in series with this circuit.

Now. the total flux is a measurable quantity; as to the leakage flux, it can be determined easily enough by means of a Grassot Fluxometer. To do this, one makes the coils of the telephone during their normal position $B.B'$ travel over the magnet, until they reach the center of the latter. The diaphragm of the telephone is meanwhile in its regular normal position. All the lines of force that are cut during this passage belong to the average

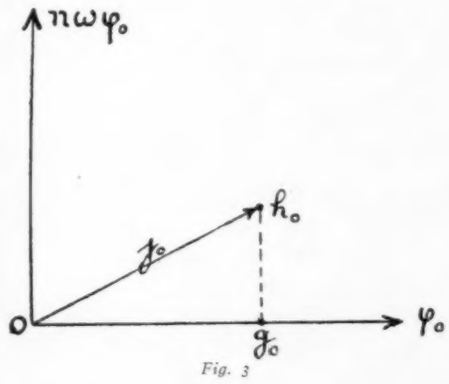


Fig. 3

leakage flux of the telephone, looked at in relation to the coils used.

The tube of useful flux does not necessarily mean a constant volume of iron. Consequently we find its reluctance variable, not only due to the fact that the air gap varies, but also because the sections σ and σ' in the midst of the magnet and of the diaphragm vary. Finally this reluctance has a third cause for its variation due to the changing permeability of iron with changing flux or different magnetizations.

These circumstances would complicate the problem quite a little, if it were not for the fact that we can attribute most of the changes in reluctance to a known cause, namely the changes in the air gap. As a matter of fact, calculations would show that the reluctance due to the two air gaps of the telephone is more than ten times as great as that which belongs to the iron portion of the circuit. Under these conditions we have the right

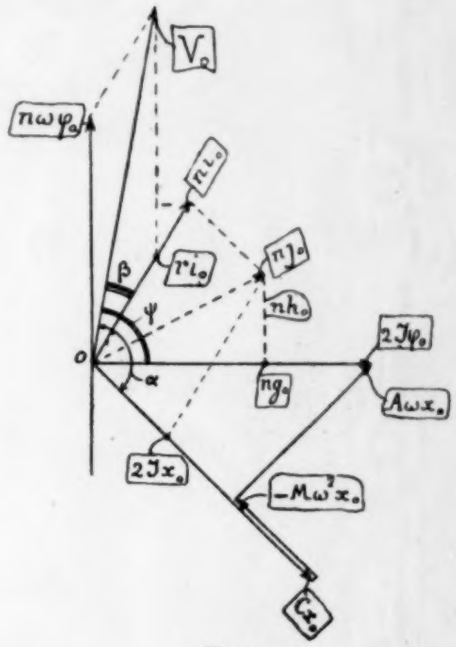


Fig. 4

to neglect the variations of the sections σ and σ' and to consider the tube of useful flux as approaching the state of a corresponding constant volume of iron. There remain then only the changes in permeability due to the influence of the varying flux.

We are going to apply the formula of Hopkinson to the tube of flux, without troubling with these variations at first; we can then bring in the corrections necessary to derive more approximate results. The calculations which we are going to make are moreover quite commonly used in a number of theories of the same order, notably in theories dealing with the transformer; there seems to be no reason then for doubting its application in the case of the telephone.

II. Representative Diagram of the Working of the Telephone: Let M be the variable magnetomotive force in the "tube of useful flux," Φ be the flux at any instant and let R be the reluctance of this tube, which we will suppose corresponds to a constant volume of iron. From the formula we can then write: $M=\Phi R$. Let us then put: $M=M_0+4\pi ni$

$\Phi=\Phi_0+\varphi$

$R=R_0+\rho$.

M_0, Φ_0 and R_0 represents the average values of Φ, of M, and of R: $4\pi ni$, φ and ρ being the respective variations of these magnitudes; finally n is the total number of windings for the two coils, i is the current in these coils; we will write the equation: $M_0+4\pi ni=(\Phi_0+\varphi)(R_0+\rho)$. (1) Now, if no current circulates in the coils, we have: $M_0=\Phi_0 R_0$. (2). If the variations φ and ρ are small in

comparison to average values Φ_0 and R_0, we can neglect the product $\varphi\rho$ and write, subtracting (2) from (1):

$$4\pi ni = \Phi_0\rho + R_0\varphi, \quad (3)$$

from which we can obtain the value of φ:

$$\varphi = \frac{4\pi n}{R_0} i - \frac{\Phi_0}{R_0}\rho, \quad (4)$$

As we are neglecting for the time being the changes of permeability of iron under the influence of the varying flux, the change in the reluctance is only to be imputed to the change of the air gap. If x designates the elongation of the vibrating diaphragm at each instance, starting out from its position of forced equilibrium, and if we count it as a positive factor, when it approaches the magnet, and if S designates the average section of each air gap, we will have (as there are two air gaps):

$-\rho = 2\frac{x}{S}$ and the equation (4) can be read:

$$\varphi = \frac{4\pi n}{R_0} i + 2\frac{\Phi_0}{SR_0} x. \quad (5)$$

Let us then place: $\Phi_0 = 4\pi TS$; and we can give the equation (5) the symmetrical form:

$$\varphi = \left(\frac{4\pi n}{R_0}\right) i + 2\left(\frac{4\pi T}{R_0}\right) x. \quad (6)$$

Consequently T represents approximately the value of average magnetization in the air gaps.

Such is the third relation sought for between φ, i and x, if we neglect the variations in the permeability of the iron, i. e., if we replace the magnetization curve of the magnetic circuit of the telephone by a straight line and if we leave out of the computation the phenomena of hysteresis.

In fact we can liken the term $8\pi Tx$ to a magnetomotive force and consider everything relating to the equation (6) as being of a condition in which the flux φ was the resultant of the two magnetomotive forces $4\pi ni$ and $8\pi Tx$, applied to a magnetic circuit of constant reluctance R_0.

Admitting then the relation (6) as exact, we will come to the point where we consider the magnetization of the magnetic circuit (or its flux) as a linear function of magnetomotive forces applied to this circuit. But this circuit, being composed of iron, we know that this is not so.

In reality under the influence of the periodic magnetomotive forces $4\pi ni$ and $8\pi Tx$, the flux φ can likewise be represented by a periodic function; only on account of the phenomena of hysteresis, there will have to be an angular displacement of φ in the resultant of the magnetomotive forces.

If we represent the function: $\Phi = F(M)$ (7) by a curve, calling M the vector: sum of the magnetomotive forces, we will have a small cycle, more or less similar to an ellipsis, which will be more or less inclined towards the axis OM, and will have a fairly large surface, as seen in Fig. 2.

Although we allowed only small variations for Φ and for M, it may happen that with higher frequencies, the ellipsis will tend to take the form of a circle and consequently under such cases the angular displacement of φ on M cannot be neglected. If we liken, as we have just done, the term $8\pi Tx$ to a magnetomotive force, the functioning of the telephone can be likened to that of a transformer. The primary circuit would then be that of the coils, and the secondary would not be represented any more by a coil through which a current passes, but rather by its magnetic equivalent, whose action would not be expressed by a certain number of "ampere-turns" but by a certain number of "units of magnetization centimeters" (Tx).

In a transformer, if we designate by n_1i_1, n_2i_2 the primary and secondary ampere-turns, by Q the flux common to the two windings and by R the average reluctance of the magnetic circuit, we would have according to Hopkinson's formula: $\frac{4\pi}{R}(n_1i_1 + n_2i_2) = Q$. (8) But here the vector Q is not in phase any more with the vector sum of the magnetomotive forces on account of the hysteresis and the Foucault currents. If we then designate by I a current such as we have in equation (9), $n_1i_1 + n_2i_2 = n_1I$, (9) we know that the current I is called the magnetization current or primary current and it is this primary current which produces the same flux Q in the open secondary.

We determine I by considering it as the resultant of a magnetizing current I_m in phase with Q (wattless current) which we calculate from Hopkinson's formula: $\frac{4\pi}{R} n_1 I_m = Q$ and of a current I_p, which we calculate by equating the power to which it corresponds to the losses from hysteresis and from Foucault currents. Knowing I as a function of Q and knowing the losses in the iron, we finish the calculation by setting the equation (9) in place of (8). We can work in the same way with the telephone, but first we must have the first two equations.

Let r be the total ohmic resistance of the two coils, the equation of the current in these two coils will then be:

$$ri + n\frac{\partial\varphi}{\partial t} = V_0 \sin\omega t. \quad (10)$$

Let us suppose the electromotive force $V_0\sin\omega t$ applied to the same coils; as φ is the useful flux, or at least the variable portion of the flux, and as we neglect the action of the leakage flux, there is no other e. m. f. induced in these coils except $n\frac{\partial\varphi}{\partial t}$.

Let M be the mass of the vibrating diaphragm, which we suppose is displaced by a uniform movement, like an armature attached to a spring; let C be the elastic constant of the diaphragm, such, that the elastic reaction be equal to $-CX$ (X being the displacement of the diaphragm starting out from its supporting area). Let A be a weakening coefficient, such that, multiplied by the speed of the vibrating diaphragm at any moment, it will furnish passive resistance. This coefficient will include the total weakening effect, due to the air, the weakening due to losses of energy in the fixed supporting portion of the diaphragm and the elastic hysteresis.

If we assume the magnet at first raised, the equation for the movement of the diaphragm will be:

$$M\frac{\partial^2 X}{\partial t^2} + A\frac{\partial X}{\partial t} = -CX \quad (11)$$

which expresses, that the forces of inertia and the passive resistances are at each moment equal to the elastic reaction.

If we return the magnet to its place, the diaphragm is forced down and a quantity X_0 is displaced, such that the elastic reaction $-CX_0$ which results becomes equal to the attraction of the magnet.

Now, the average flux in the air gaps being Φ_0, the attraction on the diaphragm will be: $2\frac{\Phi_0^2}{8\pi S}$ (since there

are two air gaps). We will have in the forced position of equilibrium of the diaphragm:

$$\frac{\Phi_0^2}{4\pi S} - CX_0 = 0. \quad (12)$$

But during the functioning of the telephone, the flux is $(\Phi_0+\varphi)$, and the force of attraction which results, neglecting the square of φ:

$$\frac{\Phi_0^2}{4\pi S} \quad \frac{\Phi_0\varphi}{2\pi S}\varphi$$

But, at this moment, the elongation of the diaphragm has become (X_0+X) and the resultant elastic reaction is $-C(X_0+X)$. The resultant force F, acting on the diaphragm at each moment will be: $F=\frac{\Phi_0^2}{4\pi S}+\frac{\Phi_0}{2\pi S}\varphi - CX_0 - Cx,$

or, taking account of (12) $F=\frac{\Phi_0}{2\pi S}\varphi - Cx$. The equation for the movement of the diaphragm, influenced by the changes in flux φ will be:

$$M\frac{\partial^2 X}{\partial t^2} + A\frac{\partial X}{\partial t} = F = \frac{\Phi_0}{2\pi S}\varphi - Cx;$$

taking account of the fact that the derivatives of X and of x are equal, we have:

$$M\frac{\partial^2 x}{\partial t^2} + A\frac{\partial x}{\partial t} + Cx = \frac{\Phi_0}{2\pi S}\varphi. \quad (13)$$

Let us finally place: $\Phi_0 = 4\pi TS$, we have: $M\frac{\partial^2 x}{\partial t^2} + A\frac{\partial x}{\partial t} + Cx = 2T\varphi$. (14) These equations (6), (10) and (14) must suffice to solve our problem. Let us then put in the case of the transformer: $ni + 2Tx = nj$. (15) The current j is that which will produce the same variation of flux φ, if the diaphragm were stopped from vibration by an infinite resistance, which is the case of an open secondary. We will then imagine the current j as the resultant of a magnetization current (wattless) in the phase with φ, and of a current of losses (watt current), squared with φ.

Let g be the magnetization current: it will be given by the equation of Hopkinson ($\varphi_0 G_0$ designating the maximum amplitudes). $\frac{4\pi n}{R_0} G_0 = \varphi_0$. (16)

As to the Watt component h, we can calculate it by equating the energy which corresponds to it with the losses in the iron due to hysteresis and Foucault currents. $n\omega\varphi_0 h_0$ = losses in the iron (see Fig. 3). To calculate these losses we need only take such well known equations as the ones worked out by Steinmetz for hysteresis. In the case of Foucault current since, in general, magnetic circuits of telephones are made only with segments of slight thickness, and since, in all cases, the diaphragm is in one single piece, it is probable that the standard equation for these currents can be used. Knowing the current j as a function of φ, and knowing the losses in the iron, we can finish the calculation, starting out from equations (10), (14) and (15) as follows:

$$ni + 2Tx = nj \quad (15)$$

$$ri + n\frac{\partial\varphi}{\partial t} = V_0 \sin\omega t \quad (10)$$

$$M\frac{\partial^2 x}{\partial t^2} + A\frac{\partial x}{\partial t} + Cx = 2T\varphi. \quad (14)$$

We can verify the system (10), (14), (15) by using the following equations of φ, i and x:

$$\varphi = \varphi_0 \sin(\omega t - \Psi)$$
$$i = i_0 \sin(\omega t - \beta)$$
$$x = x_0 \sin(\omega t - \alpha).$$

The vector construction for the problem as shown in Fig. 4. We construct first the current j as was indicated, giving it arbitrarily the vector value φ_0, then we construct the equation (14), which will give x_0 and its phase in relation to φ_0 and to j_0. We will then construct equation (15): The vector nj_0 is the geometric sum of the vectors $2Tx_0$ and ni_0. We thus obtain the current i_0, all that remains to be done is to build up $n\omega\varphi_0$, with ri_0; in order to obtain V_0, which will then give all the phases. According to the diagram, we can calculate the energy absorbed by the vibrating diaphragm during any one period and relate it to the unit of time:

$$\tau = T\varphi\omega x_0 \sin(\alpha - \varphi).$$

The total energy consumed in the form of current will be: $W = \frac{1}{2}V_0 i_0 \cos\beta$.—Henri Tournayre in *L'Industrie Electrique.*

(To be continued.)

Girls in France Protest Nicknames

American telephone girls in France have registered the same kind of protest against nicknames that the soldiers have, the Y. W. C. A. War Work Council announced. The War Deparment has transmitted their protest against the "hello girls" appellation. Hereafter, according to an official statement, they are to be known as the Woman's Telephone Unit of the American Signal Corps.

Tho homes for these girls have been opened by the Y. W. C. A., one at 32 Rue Hamelin, Paris, formerly the Hotel Ferras, in charge of Mrs. Lulu Erick Taylor, of Detroit, and the other at Tours, formerly the Hotel Moderne, in charge of Miss Elizabeth F. Fox, of New York.

The girls operate typical American telephone exchanges installed by American telephone men and handle all telephone connections for the American Expeditionary Forces between headquarters and the different bases.

The homes and foyers provided for the girls were all established by the Y. W. C. A. War Work Council under the supervision of the Commission on Training Camp Activities.

The Phonettes

They're here and there. They say "seventy-five" instead of "sixty-fifteen" as the French ones do. They say "Hold the wire" instead of "Attendez un moment"; "General Pershing" instead of "le General Peurchigne," and *"Thahnkew!"* instead of *"Mairrsee!"* In short, it seems like home to hear them talking over the wires.

The original 33 of the phonettes' expeditionary forces have made good on their jobs. Equally at home in French and English, they juggle the two languages about with marvelous dexterity, and all without disturbing a back comb. Their work is important work. We wonder how we got along without them all this time.

But, best of all, they never say, "A dollar and a half extra, please! You talked with the young lady for three-quarters of an hour overtime." In the first place, they attend to calls on army business only. In the second, there aren't any dollar-and-a-halfs in France. So they haven't a chance to deliver that irritating message of bygone days. Our relations are wholly pleasant. We thank them.—*The Stars and Stripes,* published in France.

Of Interest to the Trade

What the Telephone and Accessory Manufacturers are Doing to Advance the Art

Keep Public Informed of Growth

A manufacturing plant, of large or small size, may go along and do a good business year in and year out and not attract the attention of any of the town's inhabitants but the minute this concern begins growing to a stage where it is necessary to build additions and otherwise enlarge its manufacturing facilities, instant attention springs up regarding both the manufacturer and the product.

Your telephone exchange may be growing by leaps and bounds, but still the inhabitants of the town may be unaware of this fact, as the exchange building will probably never need enlarging and always remain the same from external appearance.

Your good fortune is your subscribers' good fortune. Have you ever thought of it that way? Every new telephone installed in your town increases the value of your subscribers' instrument by a large percentage. Nothing interests your present and prospective subscriber more than the daily growth of the home industries and the telephone is a great, if not the greatest, factor in promoting them.

Keeping the public posted on the number of telephones in service will create a surprising amount of interest. For this purpose, the Kellogg Switchboard & Supply Company has prepared and is distributing free of charge an illustrated window hanger with a complete set of numbers. This enables the exchange to keep daily before the public the number of telephones they have in service. Hundreds of independent telephone exchanges have already taken advantage of this novel scheme of awakening interest in their service, and it has proved very successful.

This poster does more than merely tell the number of telephones in your exchange—it indicates enthusiasm, energy, good service and a continuously improved service. It indicates an effort to give the most reliable signaling, switching and transmission. It also indicates the increasing value of each telephone installed and those already installed

This hanger is 11 inches by 17 inches and is printed in red and black, making a very attractive addition to the window display of any telephone exchange.

One of these sets can be obtained by writing to the Kellogg Switchboard & Supply Company at Chicago.

Modern Central Office Practice

The Kellogg Switchboard and Supply Company has prepared for distribution to the telephone field a 24-page booklet on the instantaneous recall switchboard, entitled "Modern Central Office Practice."

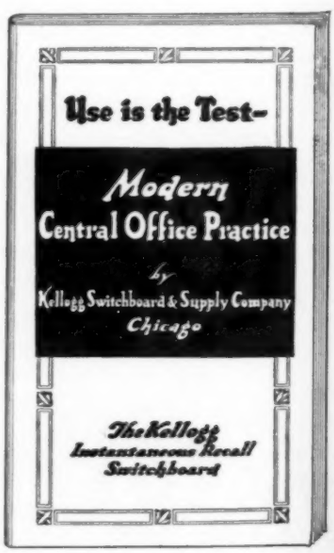
"Modern Central Office Practice" is an address given by the company's chief engineer, H. D. Currier, at a telephone convention earlier in the year, which has been repeated at other conventions by request.

The purpose of this booklet is to point out some of the features which have been incorporated in central office switchboard design within the past five years. The practice outlined has particular reference to switchboards designed for single office districts.

The author proves that the modern central office switchboard should not be classed as it is—manual, automatic and semi-automatic—but on the basis of actual accomplishment. There are several fundamental definitions of service and these may be divided under the following subjects: Automatic ringing, automatic listening, secret service, automatic peg count, call distribution, instantaneous disconnect, instantaneous recall, dark keyshelf and revertive ringing tone. Each of these definitions is explained in detail.

Especially at this time is this brief outline of the vital points of "Modern Central Office Practce" pertinent, and it is a subject that should appeal to all tele-

A Hanger in Red and Black for the Central Office Window. Supplied by the Kelloggg Company



Kellogg's Booklet on Switchboards Design.

phone men, especially those operating common battery exchanges.

Send requests for this booklet to the Kellogg Switchboard & Supply Company.

Training Employment Managers

BY EDWARD D. JONES

Author of "The Business Administrator," Professor of Commerce and Industries, University of Michigan.

The Government has found it necessary to enter the field of education on a large scale. War emergency courses in employment management, conducted by the Employment Management Division of the War Industries Board, under the auspices of five governmental departments, have been arranged for in nine universities to date. The outline of the courses of study was made by Captain Boyd Fisher, who has general supervision of the work.

These courses in employment management are designed to train men or women, who already have a basic experience of at least three years in industrial life and factory methods, and who have come in actual contact with shop problems. Employers of labor, particularly those having war contracts, are urged to suggest men or women from their own organizations as candidates for these courses. With the increasing tightening of the labor situation, it is absolutely essential that large plants have an efficient central employment department. If the Government is to take upon itself the task of furnishing labor when called upon it is necessary that that labor be employed in the proper manner. In other words, each man should be hired to do the thing he is best fitted to do. In these days every man must count and there must be no square pegs in round holes. It has been thoroughly proved that an experienced employment manager, in charge of all hiring and firing, comes very near to solving the labor problem. Therefore, it is up to the employer to place his house in order and make the best use of the men with which he is supplied.

The introduction of the employment manager into industry, and the standardization of the services of an employment department is acknowledged to be one of the greatest movements now taking place in the manufacturing industry of this country.

Courses have been arranged for at Harvard, in cooperation with the Massachusetts Institute of Technology, Boston University, in Boston; Columbia University, New York; University of Rochester, Rochester, N. Y.; Carnegie Institute of Technology, and the University of Pittsburgh, Pittsburgh, Pa.; University of Washington, Seattle; and the University of California at Berkeley.

There already have been 172 graduates from the classes conducted thus far. Most of these have returned to their own plants and placed in operation a department of employment. In each case where a central employment department is in vogue, there is never a thought of returning to the old-fashioned hit or miss method of hiring men.

The courses of instruction in the various schools run from six weeks to two months, and the classes are conducted by the foremost authorities in the country on the various subjects covered.

The course of study deals chiefly with the problems of employment management. Brief consideration is given, however, to statistics, labor economics, and business organization and management. The materials presented on the subject of employment management covers the organization and equipment of an employment department, the employing of the workers, the training of the workers, the payment of the workers, the control of working conditions, effects to keep the work up to standard, and the government of the shop. There are no charges for the course, except the outlay for living expenses of students and about $15.00 for books and supplies. It has been arranged to begin new classes as soon as each previous class is graduated so application for admission to the courses in any of the above named schools may be made at any time.

Employers of labor having candidates for admission to the classes and individual applicants, will be furnished with necessary information concerning qualifications for admission and other data regarding the courses by addressing Captain Boyd Fisher, 717 Thirteenth street, N. W., Washington, D. C.

New Aerial Radio Telephone

A practically perfected wireless telephone device, which will defeat the Germans by reducing the power of their artillery to virtual impotency, was announced by Maj. A. Cushman Rice, first American commander of a British air squardon, who recently returned from France, after being wounded twice.

"This device, which the British and French have been working on for two years now," said Maj. Rice, "will enable the allied air men to fly over the German lines and into Germany in fleets of more than 100 planes at a time, all directed by the voice of the general in command.

"This new system will sweep the Huns from the sky and put out entirely the eyes of their artillery, so that all their firing will have to be done by guesswork. On the other hand, ours will be so perfectly directed that hardly a shot will be wasted.

American Electric Absorbs Swedish; Now "North Works"

The American Electric Company, Chicago, Ill., one of the largest Independent telephone manufacturing concerns in the United States, has added to its large facilities by the recent purchase of the machinery, tools, etc., of the Swedish-American Telephone Manufacturing Company, of Chicago, and will continue operating the former Swedish-American telephone works as the American Electric Company, North Works, giving added capacity needed to care for requirements. The main office of the American Electric Company will continue at the South Works, State and Sixty-fourth streets, Chicago.

Examination for Senior Engineer

The United States Civil Service Commission announces open competitive examinations November 19, 1918, for senior engineers (civil, electrical, mechanical, signal, structural, telegraph, and telephone), for men only. Vacancies in the Interstate Commerce Commission, under the act providing for the valuation of the property of common carriers, at $1,800 to $2,700 a year, and in positions requiring similar qualifications, at these or higher or lower entrance salaries, will be filled from these examinations, unless it is found in the interest of the service to fill any vacancy by reinstatement, transfer, or promotion.

The entrance salary, within the range stated, will depend upon the qualifications of the appointee and the importance of the duty to which he is assigned, certification to fill the higher salaried positions being made from those attaining the highest average percentages in the examinations.

Brevities of the Business

The Activities of the Whole Telephone Field Told in Short Paragraphs

PERSONAL NOTES.

J. Brooke Boyle, who for the past few years was local manager of the Chesapeake and Potomac Telephone Company, has been promoted as collection supervisor for the Norfolk, Virginia, office. When Camp Meade was established last year Mr. Boyle was assigned as special agent for the telephone company to work in conjunction with the government officials of the War Department in installing adequate telephone facilities for the camp. Mr. Boyle's advancement in the company's service comes as a fitting climax for duty well performed. W. N. Montague, who succeeds Mr. Boyle as local manager for the Cumberland district, was formerly connected with the Baltimore office and has had a wide experience in the telephone field. The territory formerly supervised by Mr. Montague comprised Sparrows Point and vicinity which has recently become the center of attraction due to the activities of the Bethlehem Steel Company, Bartlett Hayward Company and other prominent manufacurers of war munitions.

Ralph Fennimore, who has been manager of the D. & M. Telephone Company at Frankton, Ind., for the past year, has resigned and has gone to work for the telephone company at Anderson. Perry Saner will take the managing position with the local telephone company.

A. R. Fairbanks is the new manager for the Northwestern Telephone Company at Crookston, Minn., coming from Wahpeton to take the position made vacant by the removal of A. E. Harris to Fargo, where he will be assistant traffic chief. Mr. Fairbanks before being transferred to Wahpeton, was for ten years local manager for the telephone company at Grafton. He has moved his family to Crookston.

Claude G. Matthews, salesman of the Western Electric Company at San Antonio, Texas, handled the account with the company which built Camp Travis. This is one of the largest of the army camps. It has a capacity of 60,000 men. This company also constructed Kelly Field, at which there have been 46,000 men stationed at one time. In addition, he has handled a limited amount of business in connection with the work at Brooks Field and Camp Stanley, Del Rio.

Dr. Baltasar Brum, minister of foreign affairs of Uruguay, accompanied by Mayor Hylan of New York, and their respective staffs, honored the International Western Electric Company with a visit on August 30. The visitors were received in the directors' room of the American Telephone and Telegraph Company by Messrs. G. E. Pingree and W. E. Leigh, of the International Western Electric Telephone and Telegraph Company. Through the courtesy of the American Telephone and Telegraph Company the transcontinental telephone line to San Francisco was made available for the occasion. Dr. Brum has been on a special mission to the United States, in return for the visit of the American fleet to Montevideo last year. He has been welcomed by President Wilson and also by the cities of New York, Boston, Pittsburgh, Chicago, St. Louis and New Orleans. Dr. Brum was received in Chicago by the Association of Commerce. W. P. Sidley, vice-president, and F. A. Ketcham, central district manager, assisted in the arrangements made for his entertainment in that city. Dr. Brum and his party reached Chicago on Sunday, September 8. A committee of the Association of Commerce, including Mr. Ketcham, met the mission on its arrival. Owing to the importance of this mission, special permission was obtained from the fuel administration to operate the necessary automobiles to take the visitors for a drive around the parks on Sunday afternoon. On that evening the Association of Commerce tendered them a banquet at the Hotel Blackstone. On Monday morning Mr. Ketcham met them with automobiles, took them over to Hawthorne and showed them around the Western Electric Company plant. Returning to town, luncheon was given to them by the Association of Commerce, and in the evening they were guests of the Association at a dinner given to the Duke of Devonshire, governor-general of Canada.

The funeral of Edward Corrigan, general superintendent of traffic of the Chesapeake and Potomac Telephone Company, at Baltimore, Md., who died recently after an illness of several months, took place at Long Island, N. Y. Mr. Corrigan was one of the best known and most capable men in the telephone system in the east. He was born in New York forty-nine years ago and when a boy entered the telephone service, being employed as exchange operator, this being before the days of girl operators. He was the son of the late Edward Corrigan of New York.

W. A. Cooper has resigned his position as manager of the local branch of the Mountain States Telephone Company at Deming, N. M., a position he has held for some months since the resignation of Manager L. C. Riley, and left for Socorro, N. M. His resignation was made necessary owing to the illness of his wife. District Manager Buehler from Prescott checked him out, installing Mr. R. Thomson of Williams as local manager. Mr. Thomson has had charge of the local station at Williams for the past three years and is well acquainted with the work in this part of the country.

A. E. Woods, who some years ago resided in Coudersport, Pa., where he was the manager of the Bell Telephone Company, died recently in Erie, Pa. He was sixty-six years of age and is survived by his wife and one daughter.

A. G. Simons, district manager of the Bell Telephone Company, received word recently of the death of W. B. Bartleson at Newport, R. I. Mr. Bartleson was until recently local manager of the Bell Telephone Company at Honesdale, Pa. Previous to going to Honesdale he held a position as adjuster at Bethlehem and Pittston, his home town, going to Honesdale from the latter place. About two months ago Mr. Bartleson enlisted in the navy and less than ten days ago he was called. He contracted a cold, which developed into pneumonia.

J. R. Weeks, who has been commissioned a lieutenant, was formerly manager of the Bell Telephone Company in Jackson, Mich.

L. R. Kirkpatrick, formerly connected with the Maysville Telephone Company at Maysville, Ky., but who for some time has been located at Nicholasville, has accepted a position as plant foreman for the Maysville Telephone Company to fill the vacancy caused by the resignation of W. C. Collins, who accepted a position with the Mason County Mutual Telephone Company.

News was recently received of the death of O. P. Smith, in Nashville, Tenn., after a short illness of pneumonia. Mr. Smith was the local manager of the Cumberland Telephone Company for several years.

J. W. Paul, manager for the Southwestern Bell Telephone Company at Eureka Springs, Ark., has accepted a position as cashier of the bank at Summers, Miss.

C. V. Hollis, district traffic chief of the central division of the Central Union Telephone Company, and the son of C. C. Hollis, manager of the Central Union Telephone Company at Muncie, Ind., died at his home, 1652 Park avenue, Indianapolis, recently. Mr. Hollis had first been stricken with Spanish influenza, which was followed by pneumonia.

Delos Owen, 51 years old, manager of the Citizens' Telephone Company at Lowell, Mich., for twenty years, committed suicide by drowning himself in Grand river. His body was recovered. Despondency is given as the cause. He leaves his widow and three children.

Albert Bush, president of the Farmers Mutual Telephone Company, at Columbia City, Ind., for the past few years and who was re-elected president at the meeting of directors of that company recently, was also chosen general manager. Since the death of the former manager, R. R. Scott, Mr. Bush has been in the office looking after the business and is now familiar with the intricacies from years of experience as president of the company. Marvin Scott, son of R. R. Scott, the former manager, was chosen as assistant manager and wire chief. Mr. Scott has held the position of wire chief for a number of years and is a capable man. His knowledge of the business secured for him the position as assistant manager. He is one of the best telephone men in the state.

Royal A. Ferris, president of the American Exchange National Bank and one of the best known business men of the southwest, was named president of the new Dallas Telephone Company at Dallas, Texas, at a meeting of the officials of the Southwestern Telephone Company and the Dallas Automatic Telephone Company. The two companies have secured a merger franchise and after minor details are worked out a single telephone system will be in operation. J. C. Casler, president of the Dallas Automatic Telephone Company since that company began business here, declined the presidency of the new company some time ago, but was named vice president of the new company. Mr. Casler's other duties were of such importance that he said he could not accept the presidency of the new company. Casler recently was named president of a million dollar oil company with holdings in the Burkburnett oil field. Ben S. Reed of St. Louis was also elected vice-president. W. R. Faught of Dallas was selected as secretary treasurer of the new concern and A. B. Elias of Dallas will be general manager. Following is the new executive committee: Royal A. Ferris, Ed-

gar L. Flippen, A. B. Elias, Clarence E. Linz and H. J. Pettingill of St. Louis.

Word came from England recently that George Howard Nash, the chief engineer of Western Electric Company's house in London, has been made a Commander of the Order of the British Empire. This order, which was instituted since the beginning of the war, is confined to civilians whom the king wishes to honor for distinguished services to the Empire. The exact service which Mr. Nash has rendered is veiled in a certain measure of secrecy, but the following paragraph from the *Passing Show*, a well-known English weekly, gives some indication of the work in which Mr. Nash is engaged: "By the way, who is the mysterious Mr. Nash of whom it is said that he has done more than any other man alive to conquer the U-boat? Sir Edward Carson believed that if the British public knew their indebtedness to Mr. Nash there would be a statue erected to him in every town in the kingdom. Why should not the British public know?" To his associates in the Western Electric Company on this side of the Atlantic, the identity of Mr. Nash is no mystery, and they all will be glad that he has been so signally honored.

Edward B. Craft, one of the Western Electric Company's assistant chief engineers, has just returned from a trip to Europe undertaken at the request of the government for the purpose of making a technical inspection of communications. He left New York in the middle of June. During his stay in Europe Mr. Craft saw a large part of the battle line, one stage of his journey being an automobile trip along the part of the line held by the French and American troops. While he was in Nancy the town was bombed by German aeroplanes, some of the bombs falling less than half a block away while Mr. Craft was on the balcony of his hotel watching the anti-aircraft guns in their attempts to repel the raiders. Another interesting experience was a flight of 180 miles in an aeroplane over England.

Another well earned promotion has come to a Chicago Telephone Company soldier, and it is now Major Daniel E. Moore of the Signal Corps. Major Moore received his commission, which was a promotion from the rank of captain, while he was enjoying a short furlough at his home in Chicago the latter part of August. It is reported that he has been given command of the 419th Telegraph Battalion and if this is true he will be the second Chicago telephone man to receive this high command, the other being Major John R. Turner, now in command of the 410th Telegraph Battalion in France. Major Moore is a graduate of the Armour Institute of Technology, and when war with Germany started had been in the telephone organization for ten years. He was equipment engineer assigned to work for the suburban division. Major Moore is the son of Mrs. D. E. Moore, superintendent of the operators' training school in Chicago.

Lieutenant Colonel Philip L. Spaulding, who in civil life is president of the New England Telephone and Telegraph Company, has been promoted to colonel in the Bureau of Aircraft Production under John D. Ryan. Colonel Spalding is one of the men of our country who have sacrificed big business positions in order to help win the war. At the outbreak of hostilities with Germany he immediately turned his attention to the problem of furnishing the best of telephone service to the government. He received a call to active service in October, 1917, was commissioned a lieutenant colonel in the signal corps, and assigned to the aviation section in France. In less than a month he was at the front and after several months of active service was called to Washington to report on conditions as he found them. The promotion to colonel followed, and his friends and business associates all agree that it was well earned.

Capt. Angus S. Hibbard, former general manager of the Chicago Telephone Company, has been charged with the important mission of reorganizing the telephone system of the American Red Cross in France, according to an official announcement made by the Red Cross. So great has been the work of the Red Cross in France that it was found necessary to install a complete telephone system.

James Walton Harrison of the toll line division, Illinois engineering department of the Chicago Telephone Company, died of pneumonia at his home in Highland Park, on September 25. He was ill only a few days. Mr. Harrison was born on May 4, 1884, near Melrose, Rockingham County, Va., and in 1901 moved with his parents to Highland Park. He began work for the Chicago Telephone Company in 1904 as a troubleman at Highland Park. In 1907 he was transferred to Glencoe and promoted to wire chief. Four years later he was called to the toll division of the engineering department. Mr. Harrison was esteemed by all with whom he came in contact for his genial ways and willingness to help others. He will be greatly missed by many friends and business associates both in and outside of the telephone business.

Edwin F. Snyder of the construction department of the Chicago Telephone Company, died at his home, 549 West North avenue, Chicago, on September 26. Mr. Snyder, or "Ed," as he was known to his co-workers, was a Telephone pioneer. He started his telephone career in 1879 with the Cincinnati Telephone and Telegraph Company, and came to the Chicago Telephone Company in 1883, returning to Cincinnati the following year. Soon after, he went east, continuing in the telephone business, and returned to the Chicago Telephone Company in 1893. An authority on plant department records, Mr. Snyder had the reputation of carrying more accurate information of this kind in his head than most clerks could find on the records. His loss will be keenly felt by the plant record division, as he was always jolly, affable and courteous, and never too busy to give seekers of informatnon his personal attention and aid. The construction department sent a beautiful floral tribute when Mr. Snyder's funeral was held.

W. W. Johnson of Jefferson City, Mo., formerly secretary of the Independent Telephone Association of Missouri, has become the telephone expert for the Missouri Public Service Commission. He succeeds George Player, son of former Comptroller Player of St. Louis, who resigned to enter the army.

G. F. Green, owner of the Brewster-Bridgeport telephone exchange, at Brewster, Wash., sold the system to Milburn Alexander of Brewster. Mr. Green will move with his family to Ripon, Cal., where he has purchased a telephone system.

A. M. Fishburn, who has been district manager for the Cumberland Telephone Company at Lake Charles, La., with headquarters in this city for the past two years, leaves in a few days with Mrs. Fishburn, for Gulfport, Miss., where he will fill the same position that he has filled here. Mr. Fishburn was district manager at Gulfport in 1912 and 1913 and is well acquainted throughout that section, so he will not be going to a strange place. Mr. Fishburn will be succeeded by W. P. Craddock, Jr., who has been for the past three years chief clerk in the superintendent's office at New Orleans. While Mr. Craddock never resided in Lake Charles he is not exactly a stranger, his father having resided here at one time and his mother, one sister and one brother, Harry, residing here at present. Mr. Craddock has made numerous attempts to get into the service but has always been turned down on account of heart trouble.

Miss Mary Snow of Lowell, Mass., an experienced telephone operator of the Bell company, is chief operator of the American telephone girls in Paris.

A. C. Cornell, sales manager at Denver, Colo., represents the Western Electric Company as a member of the Commercial Economy Board of the Council of National Defense. This committee has recommended the division of the city into proper zones for the efficient adoption of the one delivery a day program.

M. A. Curran, formerly manager of the line material department of the Western Electric Company, has been appointed assistant manager of the Philadelphia house, reporting to L. M. Dunn. G. F. Hessler will be in charge of the work formerly handled by Mr. Curran. W. W. Templin, specialty sales manager, has taken up special work in the government department, reporting to H. L. Grant. W. D. Lindsey will, in addition to his duties as assistant advertising manager, be in charge of the work formerly handled by Mr. Templin.

Charles G. Roebling, president of John A. Roebling's Sons Company, Trenton, N. J., died on Saturday, October 5.

Parley V. Gardner, 34 years old, died recently with pneumonia at his home, 536 First avenue, Olean, N. Y. Mr. Gardner was well known in the city, being connected with the Bell Telephone Company. He is survived by his wife and father, Blake Gardner, of Olean.

The first golden star was placed on the service flag of the Southern Bell Telephone and Telegraph Company September 7, when announcement was made that Lieutenant Britt Journey had been killed in action in France on August 11. He was formerly district traffic chief at Raleigh, N. C., and his home was in Nashville, Tenn. Lieutenant Journey was in Company H, Thirtieth Infantry, 82d Division, and was as popular and efficient as an officer as he had been in the telephone service. His death brought the war home to the telephone family as no other incident has and renews the determination to eliminate the hun. Lieutenant Journey was the only son of Mr. and Mrs. James M. Jonrney, of Nashville, Tenn. He was born in Nashville, November 29, 1891, and was therefore twenty-six years of age last November.

Lieut. Michael Komorowski, of the Western Electric Company, at Hawthorne, now in the United States army, was recently decorated by King George of England for leading his platoon to its objective with unusual gallantry on July 4.

Jerry M. Wilson, manager of the Morgantown and Nashville, Indiana, telephone lines, was injured severely when he fell from a telephone pole.

E. F. Patterson, business manager of the Bell Telephone Company in Union, Pa., received word that Gaye A. Dull had died in the Franklin hospital recently following

an operation for appendicitis. For ten years Mr. Dull had charge of the railroad contracts for the Bell company with an office in Pittsburgh. Last June he took a position as sales manager for the Byerly Oil Company, with an office at Franklin. He was a member of the Pittsburgh Athletic Association and was captain of the Pittsburgh track team. Deceased is survived by his wife, Mrs. Emma Sittler Dull, sister of Uniontown, and one child. He is also survived by his parents and one brother Myron, in a hospital in France.

Frank Anderson, manager of the local office of the Mountain States Telephone & Telegraph Company, at Caldwell, Idaho, who volunteered his services to the government several months ago for duty in the signal corps, recently received an order to report for duty at Fort Leavenworth, Kan. For the past two years Mr. Anderson, who is very popular in business circles, has been the manager of the telephone company in Caldwell. He is greatly elated over the acceptance of his services by the government.

Traveling Auditor Knudson of the Southwestern Telephone Company went to Waxahachie, Texas, recently for the purpose of checking in the new manager, J. F. Clayton of Dallas, who succeeds Clyde Hunter, resigned. Mr. Hunter tendered his resignation some days ago, and is just now getting relieved. He is succeeded by an experienced telephone man and a capable manager. Mr. Hunter in a statement to a newspaper man said he did not know just what he would do but that he is retiring from the telephone business.

Howard C. Whitmoyer, local manager of the Bell Telephone Company at Lewistown, Pa., but a former Harrisburg boy, has resigned from that company and will enter military service at Camp Greenleaf, Ga. Whitmoyer spent his boyhood days in Harrisburg. He is a graduate of the Central High School and the University of Pennsylvania. He is 33 years old and unmarried, and is the son of the late Mr. and Mrs. Simon Whitmoyer, who resided at 2250 North Second street. Whitmoyer has three brothers in Harrisburg who are all connected with the Pennsylvania Railroad Company. He entered the telephone field in Altoona on February 8, 1915, in the commercial department, where he was regarded as a valuable employe. Due to his excellent work he was made local manager at Lewistown on July 9, 1915.

NEWS FROM THE FIELD.

ALABAMA.

A petition has been filed with the Alabama Public Service Commission by the Clay County Telephone Company of Ashland, asking for an increase in telephone rates, and the case has been set down for hearing October 7. The company wants to advance its rates as follows: Business telephones, $3 to $3.50 a month; residence telephones, $1.25 to $1.50 a month; private residence telephones, $2 to $2.50 a month. It also is desired to charge 25 cents more for desk telephones than for wall telephones.

ARKANSAS.

The Citizens' Telephone Company of Charleston has served notice that hereafter all calls must be made by number. It will no longer be possible for subscribers to say "Give me Jones' grocery," or "Give me the depot," and get it.

CALIFORNIA.

Application was made jointly by the Whittier Home Telephone and Telegraph Company and the Downey Home Telephone Company of Los Angeles county asking the commission to approve as charges against subscribers the installation charges authorized by Postmaster General Burleson as telephone and telegraph administrator, and also the charges for change of name and changes of location within the premises, also ordered by him, and to make them effective as of September 1.

The Home Telephone Company of Long Beach has taken over the telephone systems of Long Beach. The action was in accordance with authority recently granted by the State Railroad Commission. It will be six months, however, before the systems can be operated as a single unit, officials of the companies stated.

The gross earnings of the Pacific Telephone and Telegraph Company of San Francisco for the last year amount to $4,831,110.77. The company will pay the city its return on these figures under the agreement by which it was allowed to take over the franchise of the Home Telephone Company.

The Union Home Telephone and Telegraph Corporation, operating in Los Angeles and San Bernardino counties, filed an application with the Railroad Commission recently for authority to make specific increases in its rates. The application states that the company has been carrying a deficit varying from $6,000 to $14,000 a year for the last ten years, in spite of economies in operation introduced and the absence of a sinking fund requirement of 2 per cent, or any charge off for depreciation. Increases in costs of service have made it impossible for the company to provide for necessary enlargements. The actual deficit shown by the records cited by the company is $60,742.73 on all of its business. Most of the Union Home system has been consolidated with the Pacific Telephone and Telegraph system. Plants at Long Beach and San Bernardino, which the company is still operating, are to be merged with the Pacific Company's system as soon as possible. This merger will probably be effected, the application says, in less than a year.

Applications to increase the telephone rate in San Bernardino has been filed with the state railroad commission at San Francisco, following the consolidation of the Pacific and Home companies.

CANADA.

The Ontario Municipal Electrical Association will shortly enter upon a campaign for the establishment of a public telephone system in connection with the hydro electric system, whereby it is proposed to operate in conjunction with the power systems for both urban and rural distribution.

COLORADO.

The Sand Hill Telephone Company, which was organized a few months ago by farmers south of Hugo, has connected its line with the Mountain States Telephone Company.

GEORGIA.

The Southern Bell Telephone and Telegraph Company at Atlanta has filed a petition with the Georgia Railroad Commission for authority to increase long distance tolls generally and for a number of local rate increases it became known when C. Murphy Candler, chairman of the commission, made public a copy of a letter sent by the commission to the company.

The North Georgia Telephone Company has filed a petition with the state railroad commission to be allowed to increase telephone rates in Winder. No date has been set for a hearing of this petition.

The Southern Bell Telephone Company announced recently that it is installing several hundred "pay" telephones in Atlanta. The regulations governing the indiscriminate use of merchants' telephones by the public was approved several months ago by the railroad commission. "The new type of telephone is similar to the pay stations used in New York and other eastern cities. The operator cannot be signaled until the coin is deposited. If the number is busy or does not answer the coin is automatically returned by the operator. These new telephones are expected to conserve time and service and relieve the business houses of Atlanta of the burden of furnishing free telephone service to the public. Operators are said to be able to handle calls on 'pre-pay' telephones in one-half the time required on the present public telephones and thus render more efficient service." This is the statement made by the telephone company. It is said that the installation of these telephones was made necessary by the unlimited use made of the telephones in the business district, which use grew to such proportions as to become a serious item of expense and a troublesome traffic problem. The service difficulties grew so serious on account of shortage of material and labor due to war activities that the telephone company presented the matter to the railroad commission in an effort to eliminate the thousands of frivolous and unnecessary calls made by the public over the telephones of business houses.

ILLINOIS.

The Illinois Public Utilities Commission issued an order recently suspending until January 28, 1919, the proposed advance in rates of the Mount Auburn Telephone Company in Mount Auburn, Christian county.

A merger of the telephone and telegraph systems in Harvard is the next step to be taken by the federal government, which has taken over the two public service corporations. The merger will go farther in many instances the postoffice being added where the same is possible. That is, the three will be in the same building and directed under federal control.

Negotiations are under way, it is understood from reliable sources, for the purchase of the Queen City & Shelby County Mutual Telephone Company's plant in Shelbyville, and while no definite transaction has been made and the deal may not go through, it is known that an option has been procured on the stock of the two heaviest stockholders that an effort is being made to obtain at least 51 per cent of the stock, with the purchase of additional stock later. It is understood that the prospective purchaser, in the event of his securing control of the system, proposes to erect a substantial building and make the system thoroughly modern in every respect.

The Chicago Telephone Company has increased the pay of its operators. They

are now paid for all overtime and holidays.

The Mann Telephone Company at Augusta has taken over all the property of the Western Illinois Telephone Company in Adams, Hancock and McDonough counties, the company being capitalized at $44,000.

The first petition to be filed by a telephone company with the Illinois public utilities commission asking for an order authorizing it to charge for the installation of new telephones according to the order of Postmaster General Burleson was filed recently by the Murphysboro Telephone Company.

Rapatee and Maquon Farmers' Telephone Company held a called meeting recently at which $10 was assessed on each share in order to wipe out some unexpected bills that have come up. The telephone, like everything else has become an expensive luxury. It will cost the line about $600 this year of which $350 will be put into permanent improvements.

The Jerseyville Telephone Company at Jerseyville has finished making the appraisal of its property preparatory to making a report to the Public Utilities Board in a petition for permission to raise the rates to subscribers. E. C. Constans of Hillsboro, Ill., assisted Dr. J. G. Schwarz with the work.

The New Boston Telephone Exchange has filed (jointly with the Illinois Independent Telephone Association) with the State Public Utilities Commission of Illinois an application for permission to increase the rates for service in New Boston. This application asks permission to increase the rates of all classes of service 25 cents per month per telephone, with a further proviso that in case the present rental charge is paid on or before the 15th of the month, the increase of 25 cents applied for before the State Commission will be given as a discount, leaving the present rates the same if such payment is so made.

The Inter-State Independent Telephone and Telegraph Company at Peotone has filed (jointly with the Illinois Independent Telephone Association) with the State Public Utilities Commission of Illinois an application for permission to increase the rates of service in: Crete, Elwood, Frankfort, Lockport, Joliet, Mokena, Peotone, Plainfield, Wilmington. This application asks permission to increase the rates of all classes of service 25 cents per month per telephone, during the period of the war in order to meet the increase in price of all kinds of telephone equipment and labor.

The Jerseyville Telephone Company at Jerseyville has filed with the Public Utilities Commission of Illinois a new schedule, which will change the rates for telephone service in the City of Jerseyville and vicinity, county of Jersey, and the said change of rates involves increases in the rates for individual line business telephones, two-party line business telephones, individual line residence telephones and rural telephones.

C. L. Hawker of Franklin, filed complaint with the state utilities commission against the Central Union Telephone Company. He charges that the company declined to install a telephone in his home, which is located on a farm near Franklin.

The Assumption Mutual Telephone Company has filed a complaint with the state utilities commission against the receivers of the Central Union Telephone Company and the Christian County Telephone Company, relative to the refusal of the latter companies to make connections with the lines of the Assumption company.

Extension by the Postal Telegraph Company of its operation by the inauguration of a telephone line between Joliet and Chicago brought out a protest from the Chicago Telephone Company. The Illinois Supreme Court ruled that the telephone is simply an extension of the telegraph and that a certificate of convenience and necessity is not required.

The Pitcher Telephone Company has filed (jointly with the Illinois Independent Telephone Association) with the State Public Utilities Commission of Illinois an application for permission to increase rates for service in Jo Daviess county. This application asks permission to increase the rates of all classes of service twenty-five cents per month per telephone, with a further provision that in case the present rental charge is paid on or before the fifteenth of the month, the increase of twenty-five cents applied for before the State Commission will be given as a discount, leaving the present rates the same if such payment is so made.

INDIANA.

Officials of the Chicago and Indianapolis departments of the Central Union Telephone Company have been consulting with contractors relative to the reconstructing and remodeling of the Bell telephone offices in Mishawaka and South Bend, preparatory to consolidating the two telephone exchanges.

The Crown Point Telephone Company has petitioned the Public Commission for permission to increase its telephone rates for business telephones from $24 to $36 a year, and the residence service from $18 to $24 a year. The rates have been unchanged since the company was organized in 1896, the petition states.

The Boswell Telephone Company and the Farmers' and Merchants' Co-operative Telephone Company of Boswell, Ind., will be sold at public auction on the street in front of the City Hall in the town of Boswell to the highest bidder on Friday afternoon at 1 o'clock p. m., November 1, 1918. An inventory of the properties has been made and will be furnished any prospective purchaser. The two companies together have approximately five hundred subscribers. The properties are in first-class going condition and the sale is for the purpose of consolidation. Terms of sale, cash or bankable paper on date of purchase.

The hearing of the petition of the local telephone company at Greensburg for an increase of rates, which had been set for September 27 was postponed by the Public Service Commission, because of more time being required to make the appraisal of the plant.

The Farmers' Mutual Telephone Company of Columbia City held its annual meeting to select a new manager to succeed B. R. Scott, who committed suicide a few weeks ago, and also to elect officers. Albert Bush, capitalist, who has been connected with the institution since it was organized, and who has been president for a number of years, was chosen. The other officers chosen were as follows: Albert Bush, president; E. E. Rindfusz, vice-president; P. F. Widup, secretary; W. H. Carter, treasurer; executive committee, Albert Bush, Melvin Blain and E. E. Rindfusz. Directors: Smith, Irvin J. Krider; Cleveland, Tom Jellison; Richland, E. E. Rindfusz; Troy and Etna, Melvin Blain; Washington, J. A. Mullett; Columbia, W. H. Carter and P. E. Widup; Thorncreek, Isaac Humbarger; Jefferson, Jacob Kaufman; Union, Albert Bush.

Equipment for the new telephone switchboard, to be installed at the local branch of the General Electric plant at Fort Wayne, has arrived at the works and is being checked over, so that the fine new switchboard can be set up with the least possible inconveniece for the busy organization. The new equipment was manufactured by the Western Electric Company, of Chicago, and when put into operation will be the finest private branch in the state. The growth of the plant has made necessary the enlargement of the telephone system now in use, as the old board originally installed for the plant, has had two 100-line additions, to keep pace with the need of new lines for the many additional buildings which have been constructed. The new board is built of mahogany and is of the multiple type, having about 1,000 lines capacity. The installers furnished by the Western Electric Company, working in connection with Mr. Murphy's department, are now making arrangements for the complete removal of the old board and additions, which were constructed for use until the new system was built. F. G. Duryee, of the electrical operation and maintenance department at the local plant, is in authority for the direction of the installation of the new board, which is to be placed at the same location as the old system, in the main office building on Broadway.

Officials from Indianapolis representing the Central Union Telephone Company's interests in Indiana were in Terre Haute recently looking into labor conditions with reference to the company's local telephone plant, and also visited exchanges in other points near South Bend. After digesting the situation they stated to the general manager of local interests, E. T. Bonds, that the South Bend exchange is in better condition in respect to labor than any in the state. The party included Frank Wampler, general manager; W. R. Hirst, division plant superintendent; C. A. Cara, division commercial engineer; J. W. Stickney, special agent for the receivers of the Central Union Telephone Company, and E. L. Hamlin, division plant inspector.

IOWA.

The Iowa Telephone Company at Carroll has announced that hereafter it will not employ collectors for the collection of monthly telephone bills in the city. Instead, the public is asked to come to the office of the company and make its regular payments.

Feasibility of a consolidation of two Sioux City telephone exchanges will be investigated by a committee consisting of the commercial managers of the two plants and the Sioux City postmaster, according to instructions received by the telephone offices from Postmaster General Burleson who, ex-officio, has been placed in control of the telephone and telegraph systems of the United States. This committee is to

make a report on the most practicable solution of the Sioux City telephone problem with a view to eliminating duplication of service and to accomplishing conservation of machine and man power. The report is to be made to the postmaster general, who then will decide whether a merger of the two systems is advisable.

KANSAS.

The Home Telephone Company long distance wires have been cut into the Bell office at Chanute and Home telephone service discontinued there.

The telephone company at Holton is putting in new underground cable and the work is progressing very rapidly. It is an interesting fact that the rolls of lead pipe weigh between four and five tons each and that a charge of $35 is made for the crating of each roll. It comes high, but the managers say that the system must be put in the highest state of perfection.

LOUISIANA.

That officials of the Southern Bell Telephone and Telegraph Company will do all in their power to carry out the wishes of Shreveport people in the proposed telephone consolidation is assured by N. C. Kingsbury, vice-president of the American Telephone and Telegraph Company, in a letter to L. F. Daspit, traffic manager of the Chamber of Commerce. "The consolidation of the two telephone companies in Shreveport, as you say, has been under consideration for some time," wrote Mr. Kingsbury, "and I can assure you the matter will be pushed to completion just as fast as it can be."

Wire thieves, cut from the telephone poles of the Cumberland Telephone Company, one mile from Citrus, La., 435 pounds of copper wire recently. Telephones at Citrus and along Lake Pontchartrain were put out of commission. Police believe the thieves carried the copper wire off in a motor-boat and would probably come up around the Old Basin. A number of linemen were sent to Citrus to repair the damage. Mr. Counce said the wire is worth 22 cents a pound.

The new switchboard installed by the Cumberland Telephone and Telegraph Company at New Orleans was put into service recently. This switchboard was ordered nearly two years ago, but the first one constructed for the New Orleans company was taken over by the government and is now doing duty in France. The "cut-over" took place in the early morning hours and the actual change was accomplished by pulling a switch, cutting off the current from the old board and establishing the connection with the new without the slightest interruption to service.

MARYLAND.

Examinations for the position of telephone and signal operator in the police stations of Baltimore were conducted recently in the rooms of the board of police commissioners. Because of war time conditions the examinations were open to both men and women, thirteen of the latter presenting themselves, while only four of the former put in their appearance.

MICHIGAN.

To enable the Coast Guard to carry on their work more effectively and ensure those sailing out of the harbor greater protection the state has installed a new telephone system at the U. S. Coast Guard station at St. Joseph. The lookout at the end of the pier will be directly connected with the local exchange and with the captain's quarters. Leonard Biederbeck, of Green Bay, assistant superintendent of telephone construction for the Coast Guard, was in charge of the work.

Two telephone systems in Caro resumed service after internal differences which were ended when subscribers threatened to remove telephones from their homes.

Extension of telephone service to new subscribers not essential to the conduct of the war has been practically suspended by the Michigan State Telephone Company at Detroit. Practically all facilities have been made subject to war demands, according to W. Benerman, traffic supervisor. All available telephone equipment in the country is being sent to France for the maintenance of lines of communication between the American forces in the trenches. Unless material and equipment are already available no new telephones are being installed. Inspections of the city where there are limited facilities and a necessity for extension of service to war industries or offices arises it is required that private subscribers give up their service.

The longest distance telephone conversation ever recorded in the copper country took place during the past week. A Quincy, Mich., man called up a man in Portland, Oregon, and conversed with him with ease. Manager F. E. Reif of the Michigan State Telephone Company's Houghton Exchange, said that the call was taken so much as a matter of course at "central" that he did not know of the call till the next day. The call covered a distance of 3,733 miles, as the connection was by way of Chicago, Denver and San Francisco.

Both the Citizen's and the Michigan State Telephone Companies are preparing to give Picricville telephone service. The Michigan State has poles in Division avenue and the Citizen's will build in Clyde Park avenue. The double line of poles will be available for either company to use as needed. Whether the service will be universal with only one exchange reaching all connections has not been determined.

Directors of the Michigan State Telephone Company declared the regular quarterly dividend of $1.50 per share on the preferred stock, to be paid September 30 to stockholders of record at the close of business on September 23.

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MINNESOTA.

All long distance telephone toll lines in Hennepin County, operated by the Tri-State Telephone and Telegraph Company are being inspected and a complete inventory is being obtained by men working under the Minnesota Railroad and Warehouse Commission. An appraisal of the physical value of the long distance lines in Minnesota is being determined.

Minnesota forest fires practically destroyed all telephone property over approximately a twenty-mile strip from Moose Lake to Duluth and Superior. The telephone exchanges at Cloquet and Moose Lake were entirely wiped out. Loss to the Northwestern Telephone Company in addition to the burning of two exchanges includes approximately one thousand poles on long distance lines, fourteen hundred feet of cable on Interstate bridge between Duluth and Superior, one hundred and fifty poles in city of Duluth and miscellaneous short sections of cable in Duluth. Service over all toll routes has now been virtually restored. George Vauder, wire chief, at Moose Lake burned to death. Telephone company's loss is estimated at about $200,000.

W. B. T. Belt, general manager of the Northwestern Telephone Exchange Company, recently informally submitted to Commissioner Fred E. Putnam of the State Railroad and Warehouse Commission, a proposition to make discounts on telephone bills expire on the tenth, fifteenth and twentieth of each month, according to exchanges, departing from the present inclusive date, the fifteenth. The plan as suggested by Mr. Belt would apply only to Minneapolis subscribers at present. On September 15, 8,799 subscribers paid $32,500 in telephone rentals at the cashiers' windows in the Minneapolis office. The plan is to substitute three discount expiration dates to avoid this congestion and incident delay. All bills will be due, however, on the first day of each month, as formerly. The tentative proposal for Minneapolis is to terminate discounts as follows: The tenth day of each month in the Main, Nicollett and Drexel manual and the Center and Snelling automatic exchanges. The fifteenth day of each month in the Kenwood, Walnut, Colfax and South manual and the Harriet, Grove and Calhoun automatic exchanges. The twentieth day of each month in the Hyland, East and Orchard manual and the North and Spruce automatic exchanges.

Northwestern Telephone Company of Minneapolis dispatched 80 linemen from the local office today for emergency work throughout the entire fire-swept territory. The work of rebuilding and repairing will require about 30 days, according to L. B. Wilson of the company. Yesterday 100,000 pounds of wire and cable and ten carloads of poles were sent to replace losses from the fire. Near Moose Lake, the Northwestern Telephone Company lost 150 poles and over four miles of cross-arms. Between Cloquet and Floodwood, the loss amounted to 25 miles of poles and wire. Between Duluth and Superior, on the interstate bridge, one-quarter mile of cable was lost by fire. An urgent request was made by the military and Red Cross at Moose Lake for a switchboard. The board was working the following day. George Vader, wire chief for the company at Moose Lake, was burned to death when he attempted to help two women escape from the fire.

The railroad and warehouse commission at Minneapolis filed a protest with Postmaster General A. S. Burleson against his order providing a fee of from $5 to $10 for telephone installation. The protest was made on the grounds that the sum proposed is excessive.

MISSOURI.

The Southwestern Bell Telephone Company of Chillicothe must be satis-

fied, at least for the time being, with the present telephone rates now in effect, according to information received by City Attorney Karl Hirsh from the State Public Service Commission. In a letter to the city attorney the commission advises that an increase in the telephone rate will be suspended by the Commission for a period of six months because of insufficient time to go into the details of the requested rate increase at this time, or until such time as the commission does finally report on the matter. The six months period would postpone the raise until the latter part of March, 1919.

Officials of the Southwestern Bell Telephone Company announced recently that they had reached agreements with Postmaster General Burleson for use by the government of the company's properties. Officials said the agreements were, in effect, that the system would be run relatively as in the past and that the government would be catered to first.

The installation of a new $100,000 telephone system by the Southwestern Telephone Company in Poplar Bluff has been completed and all the business has been changed from the old to the new building. All party lines have been discontinued and 500 new numbers will be added to the directory by the new system.

The wiremen of the Butler-Rich Hill Telephone System at Butler have completed the last of the work of installing the new cable and placing of poles. For the past few weeks the system, already bad, has been even worse, while the linemen were busy putting in new cables, etc. Over 5,000 feet of new cables have been placed in town and new wires and a large number of new poles erected to replace the old ones. Practically all the wiring in town has been gone over and rebuilt. On the south side of the square and wherever else possible, wires have been placed at the back of the buildings instead of at the front. The large bunch of wires on The Inn have been eliminated. Mr. Campbell, manager of the system, says that the new cables should greatly improve the service. He also expects to install a supervisor in the office for the operators.

The joint special telephone merger committee of the council in the lower house chamber met recently to consider the proposed merger of the Bell and Home telephone companies of Kansas City. Managers of the Bell company from St. Louis and Kansas City and of the Home from Kansas City were present.

G. W. Schweer of Winsor recently took over the majority of the stock of the Mutual Telephone Company at Monroe City. He has an option on the balance which will be turned over to him within a short time. A temporary organization was formed with the following officers, all of whom also act as directors: G. W. Schweer, president; H. J. Riley, vice-president; E. W. Schweer, secretary and manager; W. M. Patterson, treasurer, and Guy Schweer director. As has been stated, Mr. Schweer, who is an experienced telephone man, will give Monroe City a first-class telephone system and service.

Eugene D. Nims, vice president of the Southwestern Bell Telephone Company, has returned to St. Louis, after a month's absence in the east on business in regard to proposed merging of the Bell and Kinloch companies and other matters affecting telephone companies growing out of the taking over of the wire service by the government. Nims said that the companies were at work on a plan of merger. "Before the postmaster general took charge," he said, "the government prevented us from consolidating the companies, but now the matter is reversed and it is desired that we do so. We are waiting for the postmaster general to settle some of the fundamental questions before we can complete merger negotiations."

MONTANA.

Work of installing the exchange at Circle of the Farmers' and Ranchers' Telephone Company is proceeding at a good rate and it is expected will be placed in operation in the course of a week or two. The telephone line has been connected up from Lost Creek as far as Chester Anderson's, and the Hamblin line has been completed from Hamblin within two or three miles of Anderson's, and this gap will be closed by the time the exchange is in operation, when patrons will receive greatly improved service.

R. B. Adams, telephone engineer for forestry district No. 1, with headquarters at Missoula, has just returned from an inspection with Supervisor C. K. McHarg of the Helena forest, of the new telephone line just completed from Townsend to the Deep Creek ranger station, in the heart of the Big Belts, a distance of fifteen miles. At the Deep Creek station connection is made with an old line to Dry Creek, serving about twenty-six miles in all. Mr. Adams states the forest service has about 2,600 miles of telephone line in operation in Montana. Additional mileage is contemplated, but except where absolutely essential for fire protection purposes, construction will be deferred until the war is won.

NEBRASKA.

Telephone users in Omaha and throughout the territory of the northwestern group of the Bell system, embracing five states, will probably suffer an increased rate within the next few weeks. Vice-President and General Manager W. B. T. Belt of the Northwestern Bell companies confirmed statements made before the state railway commission at Lincoln, indicating the necessity of a 20 per cent increase in the Nebraska Telephone Company's gross revenue.

The Lincoln Telephone and Telegraph Company is before the State Railway Commission for a raise in rates covering most of its exchanges. In some instances the raise covers only business telephones and in some exchanges only the residence district. In Lincoln the company is asking to raise only on residence telephones from $2.25 to $2.50 a month.

The Nebraska Telephone Company filed application with the State Railway Commission at Lincoln recently for a 20 per cent increase in all telephone rates in their territory, which includes Omaha and all territory in Nebraska north of the Platte river, excepting a few local companies. The proposed increase, if granted, will apply to both local and toll charges. The company's petition to the commission represents that it faces necessary wage increases that will add $125,000 a year to its costs. The proposed increase will add $800,000 to its annual revenue. The company states that the system has been taken over by the government and that it is simply a government agency.

Expressing the desire that the government would take over his company and make rates high enough so he could make money, J. C. Steel, president and manager of the Ohiowa, Neb., telephone company, has written to the Nebraska railway commission asking for another increase in telephone rates. The commission granted him an increase last April.

Although no intimation was given as to the nature of the order, Railway Commissioner Victor Wilson announced recently that he was preparing a finding in the application of the Lincoln Telephone & Telegraph Company for an increase in rates at sixty-six exchanges, to bring these rates up to "standard," and an increase of 25 per cent on all tolls. This is calculated to raise $300,000, of which the company says $150,000 are needed for increased wages, $100,000 increased material and $40,000 for increased taxes, all due to war conditions.

The railway commission has been asked by the Steele City Telephone Company for an increase of its service rate to all subscribers at Steele City and Endicott, $1 to $1.50 per month. No distinction is made by the company between business and residence service, as to rates. It claims to have paid only 4 per cent dividends the last two years.

The Wyoming and Nebraska Telephone Company of Chadron has asked the state railway commission for a ruling on a question of rates. The company has published a rate whereby it permits Crookston subscribers to have telephone service with the Valentine exchange for an additional charge of $1 a month. The Valentine subscribers do not have such privilege with the Crookston exchange. Has a subscriber at Valentine a right to reverse a call from Valentine to Crookston and in that way evade the payment of the regular toll charge of 15 cents? The telephone company has ruled that the Valentine subscriber must pay the toll charge. The question will soon come before the state railway commission. In the past the commission has ruled that the benefits of a rate inure to the telephone instrument and that the owner or renter of the instrument cannot go elsewhere and make calls and receive such benefit. In connection with this question the telephone company desires to know whether a merchant at Crookston can permit his family to use a residence phone in conversing with Valentine when the Crookston rates say this privilege shall be granted only to business phones.

NEW HAMPSHIRE.

The Winnepesaukee Telephone Company, at Winnepesaukee has filed with the public service commission a tariff which will eliminate, effective October 1, 1918, the so-called free service between its Franklin and Tilton exchanges. Coincident with the company's proposal to eliminate this service it proposes to place in effect a reduction of $3 per year in the rates applying to service furnished through the Tilton exchange, such reduction to apply to all classes of service except six-party local residence service and rural residence service. In the case of the Franklin exchange, however, no change in rates is made. This company recently, with the approval of the public service commission, following investigation, abolished similar free service between its several other exchanges.

NEW YORK.

Hereafter, the New York Telephone Company "information" operators in New York City will request subscribers who ask them for numbers that can be found in the telephone directory, to look them up in the telephone book. Such requests now total 40,000 daily in New York City, and to

handle them requires the unnecessary use of a large amount of equipment and the waste of 800 operating hours, which is equivalent of a full day's work by 100 "information" operators. The directory is compiled and printed for New York City telephone users at a cost to the company of $2,000 a day. It is revised three times a year to cover the periods when the majority of changes of address and new telephone installations occur. Calls for numbers not in the telephone book will be handled by "information" in the same manner as before.

The New York Telephone Company has taken over the Penn Yan business of the Federal Telephone and Telegraph Company, absorbing all the former employes of the latter company. The commercial office of the Federal has been closed. Miss Purdy, for many years with the Bell company, will have charge of the consolidated business. For the present both boards will be operated, but a consolidation of operation will be the ultimate outcome.

Recently the toll rate between the Holley telephone exchange and Kendall went into effect, a charge of 5 cents for a call by number and 10 cents where a party is called for.

Announcement has been made by E. N. Lowe, local manager of the New York Telephone Company at Salamanca, that the consolidation of Bell and Federal systems here will be completed on November 1, and that the new rates for telephone service in accordance with the new schedule will become effective at that time.

The city of Buffalo continues to receive complaints that the telephone service furnished by the New York Telephone Company, instead of becoming better since the increased rates went into effect, is getting worse. Carl A. McCormick, deputy commissioner of public affairs, said that nothing can be done until it is ascertained whether the public service commission has jurisdiction over the telephone companies since they were taken over by the government. He said the city is still waiting for a reply from Chairman Hill of the commission relative to its power to conduct hearings into rates and service of telephone companies.

NORTH CAROLINA.

The sum of $200,000 has been added to the capital stock of the Piedmont Telephone Company, with head offices in Gastonia, making a total capital of $600,000. The secretary of state issued the papers for the amendment to the charter and the increase several days ago in Raleigh. This company is one of the most successful in the Piedmont territory, or in the Carolinas. It is a subsidiary of the Bell company, by which it is controlled. W. T. Gentry is president of the company at Gastonia. The field embraces hundreds of cotton mills and is a fertile one for the telephone business. It was not stated whether important extensions are to be made now or later.

NORTH DAKOTA.

Consolidation of long distance service on two competing telephone lines has recently been effected at Grand Forks with an eventual consolidation of the two properties in prospect at some future date in the interests of a more efficient service.

The automatic telephone system in use at Williston is being abandoned in favor of the drop system with girl-operated switchboards.

The Home Telephone Company at Grand Forks has built a new office and installed a first-class switchboard at Hannah.

C. R. Bonner, area manager, has returned from a managers' conference held at the district offices of the Northwestern Telephone Exchange Company at Fargo. Ways and means of effecting economy along the various lines of the business were discussed, as war conditions have made unusual demands upon the company and employes. The company's policy of furnishing courteous, efficient and dependable telephone service will be maintained.

Physical connection of the long distance lines of the Northwestern and Tri-state companies has been established at Grand Forks. Any subscriber of either may now call parties over the long distance having the other. This is the first step in the unification of the two phone companies, following action of the city council, who after a thorough investigation took steps to have the physical connection made. Because of the trouble in getting materials, it is impossible to announce when the local unification will be completed.

OHIO.

A special meeting of the stockholders of the Rushville Bell Telephone Company will be held at the offices of the company in the Village of Rushville, on October 29, 1918, for the purpose of voting upon the proposition to increase the capital stock of the company from $10,000, consisting of 400 shares of common stock of the par value of $25 each, its present capital stock, to $20,000, consisting of 800 shares of $25 each.

The Damascus telephone central began closing the office at 8:30 p. m., October 1, much against the will of the subscribers. A change may be made to keep the exchange open two hours in the forenoon and two in the afternoon.

It will take several months for the new system of charging for Bell telephones in the city to prove its worth, Commercial Superintendent R. G. Pate of the Cleveland Telephone Company stated after announcement that the first two months under the new plan had exhibited an increase in earnings below expectations. The increase amounted to only about 20 per cent, Mr. Pate said, whereas the company had estimated 25 or 30 per cent. Eighty per cent of residence telephones are within the limit; 30 per cent of business telephones are keeping calls down to the minimum, and 40 per cent of the entire system pay about as before, Mr. Pate announced.

Telephone bills of the Home Telephone Company at Toledo for October quarter are being sent out, carrying a suspended charge of 75 cents, the proposed increease that need not be paid until it is determined by the public utilities commission that it is a just charge.

A meeting of the stockholders of The Middlefield Telephone Company at Middlefield was held recently at which it was voted to dissolve the corporation. This does not affect the Middlefield Mutual Telephone Association.

The Delta Home Telephone Company at Delta has advanced the rates to both business and home patrons. The rates will now be $2 for business telephones and $1.50 for residences.

Rental rates for residence telephones will shortly be raised again by the Central Union Telephone Company at Dayton, according to recent reports. It is understood that the proposed increase will be 25 cents monthly, or $3 per year. It is further said that the proposed increase will be effective November 1, and subscribers will be so informed when their next statements are delivered through the mails. A similar raise was put into effect only a few months ago by the company, so if an additional 25 cents is demanded the total increase will be 50 cents in less than a year.

A telephone dispatching system is being installed by the Hocking Valley between Columbus and Toledo and as soon as the wiring is completed the telephones are installed. The work is progressing rapidly and the service is now in use between Columbus and Marion, while the wiring is completed as far as Upper Sandusky. It is expected that the work will be completed within a week or ten days.

The Andover Telephone Company at Jefferson have moved into new quarters in the Brayman block, which it recently purchased. This building is well adapted for this purpose. A new switchboard with 300 connections has been installed, besides other improvements made. The cable wires through the town are also added improvements. The company is sparing no expense to make the telephone system first class in all respects.

The Cleveland Telephone Company and the American Telephone and Telegraph Company have increased the salary of their switchboard operators an average of $2 per week. An official of the company stated the demand on facilities had increased about 25 per cent, and in order to take care of the enlarged service the wage was increased to keep the schools of instruction for beginners filled.

The Ohio State Telephone Company has asked the state public utilities commission for authority to increase its rates in Cleveland and London. The increase sought in Cleveland are: Business—Individual lines, from $72 to $84 per year; two-party, $54 to $60; four-party, $36 to $48. Residence—Individual, from $48 to $51; two-party, $38 to $39; four-party, $24 to $27. The hearing has been set for September 12.

Work of consolidating the Bell and Citizen's telephone exchanges in Coshocton has begun. Both exchanges will be located in the present quarters of the Bell company in the Rodgers building, at the corner of Main and Sixth streets. The first work to be done is the construction of pole leads along Sixth street, from Walnut to Main street. Larger poles will be substituted for the present poles used by the Bell company. Later it is the intention of the new company to place the wires under ground, but at present material is so hard to obtain that it will be necessary to place the new poles in the same place as the old ones. As soon as the equipment of the two exchanges has all been placed together in the Rodgers building, the work of making the necessary adjustments in the individual lines will be begun. Only in cases where both the Bell and Citizen's telephones are now in use at one residence or place of business will any change be made. The present phones will be kept in the same places. Where there are two, one will be discontinued.

City Attorney Scarlett has been notified that the Ohio State Telephone Company, against which the municipality of Columbus holds a judgment for $93,000 due on a franchise agreement, has carried its case to the United States supreme court. With interest added, the telephone company now owes the city $105,000.

Toledo telephone companies are getting ready for any possible action of the government looking to the consolidation or unification of the dual plants in this city. Tentative plans have already been made for necessary valuations of the properties. That valuation work has been completed by a corps of experts so far as the Ohio State Telephone Company's property is concerned.

The city council will ask the postmaster general to consider the proposed consolidation of the Central Union and Ohio State Telephone companies in Toledo. Members requested City Clerk Payne to write to the federal telephone controller following a motion by Councilman C. C. Colline. "One telephone system, under government supervision, will be of great benefit to the community," said Collins. "It will lessen greatly the expense to the companies and the subscribers, conserve finances, and solve a scarcity of operators and other help." Collins claimed that the two companies have no legal right to begin steps toward consolidation. He cited a recent federal order under which, for any telephone costing $2 or more a month, there will be a $5 fee for installation; one costing $4 a month a $10 installation fee, and one costing more than $4 a month a $15 installation fee. "Consolidation will eliminate the expensive service charge and minimize the office forces and scope of equipment," he added.

The Cleveland Telephone Company has filed with the state public utilities commission a formal petition asking approval of the installation rates prescribed by Postmaster General Burleson, which ranged from $5 to $15. The commission recently refused to accept a schedule for these rates presented by the Ohio State Telephone Company.

OKLAHOMA.

The work of installing the new telephone system at Cherokee is about finished. During the past fortnight fifty men have been kept busy installing the new telephones, and prior to that time, the new switchboard, which is a marked improvement on the old, was put in. The new system is the very best and is the common battery No. 9, replacing the old Keller Drop system, which called for a vast amount of work from the girls and much unnecessary movement. The new switchboard is equipped with a set of electrical devices which are great labor savers. The telephone business of Cherokee has grown with each passing year and there are at present over 400 telephones in the city. Miss Mary Woodyard, who has been the manager of the local office here for a number of years, and who is accounted one of the best in the state, has been instrumental in helping to build up the business in town. She has grown to be an invaluable aid to the company at this place.

The new traffic alarm bell and the new fire house gong recently installed at the city hall corner and in the fire house at Okmulgee, together with the equipment and installation of the same, was donated entire by the Southwestern Bell Telephone Company. The company takes much interest in the success and efficiency of the Okmulgee fire alarm system and donated the new equipment to improve the service.

OREGON.

The net income of the Home Telephone Company at Salem for the year ending December 31, 1917, showed a loss of $163,806.70, according to the annual report which was filed recently with the public service commission. This loss is greater by $115,843.80 than the loss of the previous year. The grand total operating revenue of the company was $252,002.72, an increase of $14,278.60 over the previous year. Operating expenses were $251,749.24, an increase over the year previous of $129,750.51. Oswald West was appointed receiver for the company by the federal court as a result of a suit filed by Samuel Hill.

The public service commission has received a communication from H. D. Pillsbury, vice-president of the Pacific Telephone & Telegraph Company at Salem, announcing that the company is no longer imposing installation charges of $5, $10 and $15 on applications for service filed before September 1.

Portland's telephone service is to be inspected. By an ordinance passed recently by the city commissioners, City Traffic Examiner Cousin was instructed to make a complete investigation of the service and report to the council. The report, it is expected, will be transmitted to government authorities. The resolution providing for the inspection follows: "It appearing that the telephone service now rendered in the city of Portland is unsatisfactory, many complaints constantly arising in consequence, thereof, therefore, be it resolved that the traffic examiner be directed to investigate the aforementioned unsatisfactory service in the city and report his findings to the council."

E. W. Gates, manager of the Coos and Curry Telephone Company, was in Reedsport recently in connection with putting up poles and stringing wires between Gardiner and Reedsport. Mr. Gates says that the scarcity of suitable labor is retarding the work, but that he doing the best under the circumstances that can be done to give the people of the Lower Umpqua the best of service. Some had the idea that this company was also making arrangements to string wires on the poles for the purpose of furnishing power and light, which Mr. Gates states is not the case.

PENNSYLVANIA.

M. F. Hearn, division manager of the Cumberland Valley Telephone Company, with headquarters at Chambersburg, was in Waynesboro recently seeing subscribers of the company here and in this section. The Waynesboro exchange of this company will be discontinued October 1, and after that date this territory will be served by the Fayetteville exchange. This change is due to the inability of the company to get sufficient competent help to conduct the exchange and also in the interest of conservation. There are not many subscribers now on the lines in this section and many of these will discontinue the service October 1.

Robert S. Taylor of Bethlehem has filed an appeal from the ordinance of the city of Bethlehem requiring telephone companies to place all their wires underground. The appeal was made by the Bell Telephone Company. It claims that the city ordinance should provide a section in which the wires should be run underground, instead of requiring the wires to be so placed all over the city.

By great advertisements in papers and calls from exchanges, Manager L. H. Kinnard of the Bell Telephone Company, Philadelphia, demands that only important telephone calls be made.

No telephones are being installed in Farrell except in cases where the lessee is able to prove absolute necessity, and then the telephone company finds it hard to find materials, as the government has commandeered all its supplies of wire and poles. A telephone was installed recently for Fire Chief Charles Carrell, who recently moved to Washington street, but he was forced to buy the poles for the line extension and to arrange for hauling them. The linemen who did the job said they took the wire from a house in Sharpsville, where the telephone was discontinued, and added that such sources form their only supply of wire nowadays.

The Bell Telephone Company is placing a new line of poles in place to carry its trunk and other wires into Pittston. A large force of men is engaged in the work.

The United Business Men's Association of Philadelphia, representing all boards of trade and similar organizations in that city, have urged the public service commission to compel the Bell Telephone Company to install meters on each telephone registering the number of outgoing calls. It is alleged in the complaint that the records of the company as to outgoing calls as a basis for charges are faulty.

Keystone Telephone Company at Philadelphia reports gross earnings of $130,597 for the month of August, compared with $132,327 for the same month a year ago. Surplus after dividends was $23,691, as against $30,665 in August last year. For eight months of the calendar year gross earnings were $1,067,558, as against $1,040,703 for the corresponding period of 1917, and the surplus $107,613, as against $167,091 last year.

SOUTH CAROLINA.

The Southern Bell Telephone and Telegraph Company has filed with the South Carolina Railroad Commission a petition asking for an increase in rates practically throughout the state. An increase in exchange tolls, ranging from 10 cents to 40 cents a message, is asked in twenty-four towns and cities and in a number of cities an increase from 50 cents to $1.50 a month is asked on business and residence telephones. The commission will grant a hearing on the proposal October 9.

John T. Slatter, secretary of the Columbia Chamber of Commerce, will appear before the railroad commission at its next meeting to petition the commission to refuse the increase in rates asked by the Southern Bell Telephone Company. Mr. Slatter has received many complaints from customers who think the increase unwise and unjustified.

The railroad commission has adjourned hearing on the petition of the Southern Bell Telephone and Telegraph Company asking for increased rates in certain towns and cities in South Carolina from October 9 to October 23. Increased rates are asked in Aiken, Bamberg, Batesburg, Bolton, Bennettsville, Blenheim, Charleston, Cheraw, Clinton, Columbia, Cowpens, Easley, Edgefield, Greenville, Greers, Liberty, Pelzer, Pickens, Piedmont, Prosperity, Society Hill, Timmonsville, Union.

Damage to the extent of $500 or $600 was caused at Huron, when three blocks of heavy cable wire of the Dakota Central Telephone Company fell to the ground.

TEXAS.

The order passed by the local telephone company at Ballinger increasing rates about one-third may be modified, according to a

statement made by the general manager of the company before a committee of citizens who are handling the matter. The patrons of the company recently adopted a resolution at a mass meeting discontinuing the phone service, provided the new rate is put into effect. The manager of the company stated that he would recommend to his directors that the rates be modified on account of the drouth which prevails in this country.

Manager E. M. Sims of the Bryan Telephone Company at Bryan, also owners of the exchange at the A. and M. College, has placed an order for a new switchboard and other material for the college exchange which will practically renew the plant.

The matter of the raise in telephone rates which came up at a meeting of the Cameron Commercial Club at Cameron was closed by accepting the report of the committee. It was the sense of those present that the club had no authority to act in the matter, so it was left up to the city council, which body had already announced its lack of authority.

The two telephone companies operating in Beaumont were asked to meet with the city council September 30 for the purpose of discussing a merger proposition. The council has been endeavoring for several years to get rid of the dual system and Mayor Diffenbacher has expressed a determination to take advantage of Postmaster General Burleson's order for the telephone companies to get together at the earliest possible date.

The people of Coleman, owing to an unsatisfactory telephone rate, are at this time without telephone service. A subscription list has been started for the organization of a new company.

Automatic telephones probably will be used exclusively in Dallas, when the merger of the two present companies goes into effect. Mayor Joe E. Lawther said that he favored the automatic, and that a majority of the city commissioners had expressed themselves as in favor of it. Mayor Lawther also said that telephone experts had expressed the desire of giving the automatics a thorough test as the sole telephonic medium of a city of this size, and that while representatives of the Southwestern Telegraph and Telephone Company would hold a majority of the stock in the new concern, he did not think they would object to the exclusive use of automatics in Dallas. It will be some time, however, before the merger goes into effect. Many operators will then be needed for long distance and similar work and telephone company officials believe they will be able to take care of all the operators now in their employ after the consolidation is effected.

A mass meeting of the citizens of Lockhart was held to protest against the proposed raise in the local telephone rate of both business and residence phones that is now in effect in Lockhart since September 1. Secretary A. S. Grigsby of the Retail Merchants' Association called the meeting to order and Mayor William Schofield was made chairman and City Attorney M. O. Flowers secretary. J. W. Ezelle of Austin, district manager of the Southwestern Telephone Company, was present and gave a statement of the reason for the increase.

TEXAS.

Articles of incorporation have been filed in the state department by the Dallas Telephone Company of Dallas, capital stock $5,000,000. The purpose is to construct and operate a telephone and telegraph business at Dallas. The corporation is headed by J. E. Farnsworth of Dallas, who has subscribed to $4,000,000 of the capital stock.

Stockholders of the merged telephone companies of Dallas met recently to elect officers for the new Dallas Telephone Company which has been chartered. Although the physical properties of the two concerns have been consolidated, it will be several months before intercommunicating telephone service can be established throughout the city.

J. C. Casler, president of the Dallas Automatic Telephone Company, has announced that the charter of the Dallas Telephone Company has been filed and approved at Austin. He said officers and directors of the merged corporation have not been selected as yet.

H. J. Pettingill of St. Louis, vice-president of the Southwestern Telegraph and Telephone Company, in all probability will be elected president of the new Dallas Telephone Company which was organized at Dallas recently under the provisions of the recent merger franchise. It is said that C. A. Gates, A. B. Elias or J. E. Farnsworth will be selected as vice-president. J. C. Casler and Clarence Linz will continue as directors and in high official positions with the company.

A special session of the city council was called by Mayor E. J. Diffenbacher recently for the purpose of taking up the question of merging the two telephone companies operating in Beaumont. Mayor Diffenbacher has been working industrially on the proposition and it is believed that the two concerns will try to get together on a equitable basis while volunteer action would be more acceptable.

Final settlement of the pole and wire tax suit against the Southwestern Telegraph and Telephone Company which was instituted by the city of Dallas in 1913, was effected recently when Mayor Lawther received a check for $96,411.39 from the company. Most of this money has already been anticipated by provision of the budget, according to city officials. The balance will be spent as the needs of the city develop, Mayor Lawther said.

In the opinion of A. S. Hardwicke, city attorney, the city of Dallas will be unable to interfere with charges being made by the local telephone companies for the removal and installation of new instruments. Complaints made some weeks ago by citizens claiming the charges "exorbitant" led Mayor Lawther to instruct Mr. Hardwicke to make an investigation. Mr. Hardwicke said that his ruling on the matter will be presented to the board of commissioners for action.

VIRGINIA.

The Spottsylvania Telephone Company's line at Fredricksburg was sold at public auction by Lee J. Graves, trustee, for $1,205 to Messrs. W. G. Dillard, S. P. Powell, Ocie Wright and W. H. Dickinson.

A charter has been issued to the Waldrop Telephone Company at Orange with a capital stock of $5,000, to build and operate a telephone line twenty miles long in Louisa and Orange counties.

WASHINGTON.

E. R. Schofield, owner of the building at Sixth and Washington streets, occupied by the Pacific Telephone & Telegraph Company at Vancouver, has authorized an addition at the rear of the structure to accommodate the increasing needs of the telephone exchange. Workmen have started excavating for the addition, which will be 20x40 feet in size. A combination of brick and terra cotta will be used in the construction. The addition has been made necessary by the expansion of the telephone company's local business. It will be used as a rest room for the employes, and space in the main building now used for this purpose will be taken up by an addition to the switchboard. Forty operators are now employed by the exchange, and more will be added to take care of the increased switchboard facilities.

A. T. West of Moscow has purchased the controlling interest in the Inland Co-operative Telephone System, which has an exclusive field in Pullman. Mr. West has become president of the company. J. C. Ruth is retained as manager and is also made secretary and treasurer. Mr. West is president of the Moscow and Davenport telephone exchanges and controls a long distance line from Moscow to Spring Valley, where it connects with the Bell lines.

On October 10 the Lewis County Light & Telephone Company at Morton was sold to satisfy a mortgage. This is the name given the concern after the Morton electric plant was bought about three years ago from F. M. Broadbent of Morton, by C. O. Smith. Mr. Smith was killed at the plant while trying to start the primer for his auxiliary gasoline engine.

At the annual meeting of the Whidby Telephone Company at Langley the following officers were elected: President, C. E. Feek; vice-president, Fred Funk; A. E. Peck to act as secretary, manager and treasurer; directors, R. P. Jensen, J. N. Mackie, E. E. Gaskill, A. F. McCreight and Frank Jewett. Under the management of Peck the company has prospered, the line has been greatly improved and most of the debts have been paid.

The Pacific Telephone Company at Olympia must refund installation overcharges made to people who ordered new telephones prior to October 1, according to the state public service commission. Installation rates were recently increased by the company from $2.50 to $3.50, $5 and $10.

WISCONSIN.

Herman Lemke brought suit against the Wisconsin Telephone Company at Milwaukee for $15,000 for injuries alleged to have been sustained on November 21, 1917, when he was struck by an automobile of the company as he was alighting from an interurban car.

The Wisconsin Telephone Company is constructing a new copper circuit from Madison to Rockford to accommodate the increased traffic arising at Camp Grant.

The Wisconsin-Minnesota Light & Power Company recently sold the Tomah Telephone exchange to Messrs. Phillip Grossman and F. A. Vaughn of Milwaukee. The new owners took possession on October 1, and will conduct the Tomah Telephone Company. The telephone business was taken over by the Wisconsin-Minnesota Light and Power Company when they purchased the electric lighting system from the C. A. Goodyear Company. The office will remain where it has been since a telephone exchange was first started in Tomah, with Mr. Rodenhuis, local manager for the Wisconsin-Minnesota company, in charge.